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BRAITHWAITE'S RETROSPECT.

VOL. LVIII. JULY—DECEMBER, 1868.

THE

RETROSPECT OF MEDICINE:

BEING

A HALF-YEARLY JOURNAL,

CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES.

EDITED BY

W. BRAITHWAITE, M.D.,

LATE LECTURER ON MIDWIFERY AND THE DISEASES OF WOMEN AND CHILDREN AT THE LEEDS SCHOOL OF MEDICINE, ETC.

AND

JAMES BRAITHWAITE, M.D. LOND.

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SYNOPSIS,

(ARRANGED ALPHABETICALLY), CONTAINING

A SHORT ABSTRACT OF THE MOST PRACTICAL ARTICLES IN THIS VOLUME, SHOWING, AT A GLANCE, THE MOST IMPORTANT INDICATIONS OF TREATMENT PUBLISHED BY DIFFERENT WRITERS WITHIN THE HALF-YEAR; INCLUDING SEVERAL PAPERS NOT INSERTED IN THE BODY OF THE WORK.

AFFECTIONS OF THE SYSTEM GENERALLY.

ACUTE RHEUMATISM.—*Valerian.*—Valerian administered in the form of a bath is of extraordinary efficacy in subduing the pain of inflammation attending acute rheumatism. The bath is made simply by taking ℔j. of valerian root, boiling it gently for about a quarter of an hour in one gallon of water, straining it, and adding the strained liquid to about twenty gallons of water in an ordinary bath. (Dr. N. J. Butler, p. 18.)

CANCER.—*Chloride of Zinc.*—A ready means of applying chloride of zinc in cases of cancerous or other sores, is to soak lint in the liquid produced by the deliquescence of chloride of zinc, aided by the addition of a few drops of water. It should then be hung up to dry as much as possible, and kept for use in a pasteboard box. The great convenience of the chloride of zinc lint is that the smallest piece may be used, even to a wart or pimple, or to parts, such as the eyelids, to which it would be almost impossible to apply the old paste. (Mr. W. Cooke, p. 22.)

Caustic Arrows and Carbolic Acid.—Two cases of cancer are related which were completely removed as follows: Punctures were made deeply round the tumours, by means of a broad lance, and into these caustic arrows were inserted. No pain or irritation resulted, and the tumours came away in three days, leaving a grey-coloured slough, which was detached in twenty-four hours more, by means of a linseed-meal poultice. The surface exposed was painted freely with carbolic acid, and the whole covered by wadding dipped in glycerine. It is singular that this treatment is quite painless. (Dr. J. R. Wolfe, p. 19.)

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(Arranged alphabetically), containing

A short Abstract of the most Practical Articles in this Volume, showing, at a glance, the most important indications of Treatment published by Different Writers within the half-year; including several Papers not inserted in the body of the work.

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Relief of Pain in Open Cancer.—At the Middlesex Hospital the following ointment is used with considerable success for the relief of pain in open cancer. The formula is from the hospital pharmacopœia:—Half a pound of fresh stramonium leaves, and two pounds of lard; mix the bruised leaves with the lard, and expose to a mild heat until the leaves become friable, and then strain through lint. The ointment is to be spread on lint, and the dressing changed three times a day. (p. 23.)

FUNGUS THEORY OF DISEASE.—This theory is disputed by the author, who has discovered what he calls "sulphate of sepsin" in putrefying materials, which he thinks represents the poison of organic substances undergoing fermentation, and which may be diffused through the air. He has obtained this substance by a process described, and can produce highly poisonous effects on animals. (Dr. Bergmann, p. 4.)

AFFECTIONS OF THE NERVOUS SYSTEM.

CHOREA.—*Calabar Bean.*—The action of physostigma, or Calabar bean, is that of a direct sedative to the reflex excitability of the spinal cord. It may hence prove a remedy of value in the treatment of chorea. From three to six grains of powder, thrice or four times daily, may be given to children; and from ten to twenty grains, as frequently to adults. It has been used in several cases with apparent success. (Dr. T. R. Frazer, p. 65.)

COMPRESSION OF THE BRAIN.—When compression of the brain occurs from rupture of a meningeal artery, the result of accident, the less we rely upon the symptoms and the more upon the history of the case the better. The symptoms of compression are not present at first; the patient is merely confused, and when more urgent conditions supervene he dies very quickly. It is to the interval of immunity between the accident and the occurrence of symptoms, that we must almost exclusively give attention if we wish to diagnose these cases. The symptoms preceding death are not those generally given by writers as indicating compression. The patient, it is true, becomes insensible; but he is pale, with dilated pupils, a rapid, feeble pulse, and irregular respiration. The "stertor" is only present at times, and the pulse is far from "laboured." When the blood is *under* the dura mater the symptoms of severe concussion are present from the first. The bleeding usually takes place from many small vessels, and hence it ceases short of the results which a ruptured middle meningeal will produce.

The patient may therefore live much longer, remaining throughout insensible, and with the stertor, laboured pulse, and flushed face, formerly held to be universal in compression. (Mr. J. Hutchinson, p. 42.)

DELIRIUM TREMENS.—Do not set out in the treatment of delirium tremens with the idea that sleep must be produced at all hazards, as soon as possible, by means of opiates. You run a risk of causing the patient's last sleep of all. Rather place him in bed, in a small quiet room, with one or two attendants, and he will frequently fall asleep without any opiate at all. It is rare, however, that sleep occurs before the third day. After that time opiates may be given, and no form is better, perhaps, than the old prescription of twenty drops of antimony wine with twenty drops of laudanum every four hours, keeping up the patient's strength with beef-tea. The idea is erroneous that the disease occurs owing to withdrawal of the accustomed stimulant. We must look upon the attack as the effect of excitement acting upon a previously weakened brain. It does not always do to continue the antimony long. As a rule it is better to give no stimulant, but in some occasional cases a glass of wine or beer in the form of nourishment is required. (Dr. S. Wilks, p. 48.)

EPILEPSY.—The loss of consciousness and the convulsions of epilepsy are the result of sudden and extreme anæmia of the brain. A number of facts point to this conclusion, such as that convulsions always precede death from rapid hemorrhage. When this anæmia is not caused by hemorrhage, or by a mechanical impediment in the circulation, the proximate cause is extreme contraction of the minute cerebral arteries. All cases may be divided into two distinct classes: 1, cases in which the arterial contraction is the result of a purely nervous or reflex influence; 2, cases in which the arterial spasm is a result of blood-poisoning. In the first class are included cases due to terror, anger, anxiety, vicious sensual habits, dentition, calculus, worms, organic diseases of the brain, and hereditary causes. In the second class are included cases due to uræmic poisoning, alcoholism, the presence in the blood of fever-poison, especially that of the exanthemata, as small-pox. (Dr. G. Johnson, p. 69.)

HEADACHE.—*Bisulphide of Carbon.*—Pour a small quantity of bisulphide of carbon on some cotton wool contained in a small wide-mouthed glass stoppered bottle. The mouth of the bottle should be applied closely to the temple, or behind the ear, as near as possible to the seat of pain, and so held five or six minutes. The effect is generally rapid. (The late Dr. G. Kennion, p. 86.)

Chloroform.—A correspondent of the British Medical Journal says that he has found chloroform (applied in the same manner as Dr. Kennion used bisulphide of carbon) very useful in similar cases. In those cases of hemicrania which depend on gastric derangement, eight or ten minims of chloroform given internally will materially assist. (G. F. E., p. 87.)

Local Pain.—*Subcutaneous Injection of Atropine.*—Atropine is a valuable remedy for the relief of local pain and spasm. It should be injected under the skin in a dose of $\frac{1}{120}$ of a grain of the sulphate as a commencing dose. It should be cautiously increased to $\frac{1}{60}$ or $\frac{1}{50}$ grain; more can seldom be needed, and very uncomfortable poisonous effects may easily be produced if it be pushed to higher doses. It is less frequently tolerated than morphia; but it is an interesting and valuable fact, that persons who are quite unable to bear morphia will often bear atropine, and *vice versa.* Atropine is incomparably the best of all medicinal remedies for every kind of pain in the abdominal viscera. (Dr. F. E. Anstie, p. 377.)

Neuralgia.—*Ergot of Rye.*—Ergot of rye is a remedy of great value in some cases of neuralgia, probably owing to its influence upon the sympathetic nerves, through the medium of which it restores the suspended tone of the remote arterial circulation. (Dr. E. Woakes, p. 77.)

Aconite and Quinine.—The effect of aconite in combination with quinine is valuable in the treatment of neuralgia, and this in cases in which quinine would have no effect if taken by itself. The case given illustrating this action is worth perusal. (Dr. H. M. Jones, p. 82.)

Hypodermic Injection of Morphia.—The permanence of the relief to neuralgia afforded by subcutaneous injection of morphia is infinitely greater than when the remedy is given by the mouth. Affections of this kind, which under any of the older plans of treatment would at least have been very tedious, are sometimes cured after three or four injections of one-sixth of a grain each; and very many yield after a week or ten days of such injections, repeated twice daily. It is moreover certainly the fact that there is far less tendency with hypodermic than with gastric medication to rapid and large increase of the dose, when morphia is used for a long time together. (Dr. F. E. Anstie, p. 376)

Paralysis.—*Faradisation.*—The broad rule for the application of faradisation, or the induced current, in the treatment of paralyzed muscles is this:—When the electro-motility is diminished or exhausted, faradisation will be of service;

when the electro-motility is unaffected, as it is in most cases of cerebral origin, it will not prove of any use. The question then, of the use or *not* of faradisation in a given case of paralysis involves a primary question of diagnosis. There are certain forms of *quasi*-paralysis in which the electro-motility is intact, in which faradisation is of much benefit. These are the so-called wasting palsy and local atrophy of muscles. In these cases, the paralysis of movement depends upon the loss of muscular tissue, that which remains acting normally under the faradic current, and as a rule responding to the volition. (Mr. J. N. Radcliffe, p. 54.)

Paralysis with Wasting of Muscles in Children.—In this disease which has been generally known as "essential paralysis of children," M. Laborde has shown that there is a distinct change in certain portions of the spinal cord; that the anterior columns are more translucent than natural, and of a greyish rose tint ; and microscopic observation shows changes in their minute structures. The treatment which has been found the most efficacious has been the judicious use of electricity, and it often happens [that the recovery is complete, and this after several years duration of the paralysis. The most efficacious application is that of the interrupted battery current. It sometimes happens that although galvanism is useful at first, the muscles cease to respond to it, and that they then contract readily when faradisation, the induced current, is applied. (Dr. J. R. Reynolds, p. 35.)

TETANUS.—*Atropia.*—In a case of tetanus the $\frac{1}{60}$ of a grain of atropia was given every three hours. "Within twenty-four hours the physiological action of atropia showed itself ; then the clonic spasms became less severe, and of shorter duration ; and the tonic rigidity gave way, first in the legs and neck, then in back, and last of all in the abdomen and masseters. On the sixth day of treatment by atropia, rigidity of the masseters alone remained." (Dr. G. Oliver, p. 58.)

Calabar Bean.—The most successful treatment of tetanus must be by the employment of such means as remove, or oppose, the condition of exaggerated reflex sensibility in which the disease consists. Neither opium, aconite, belladonna, tobacco, nor curare, all of which have been employed in the disease with a certain amount of success, possess the real thing required, a primary and energetic sedative action on the reflex activity of the spinal cord. Physostigma (Calabar bean) has precisely this action. Its administration in cases of tetanus should be commenced as early in the case as possible. One-third of a grain of extract of Calabar bean, dissolved in eighteen minims of water, should be injected every two hours under the skin. If administered by the mouth the extract should be used in preference to the powder, but it should not be administered by the mouth except in milder cases. Out of eleven cases treated in this way nine recovered. (Dr. T. R. Fraser, p. 59.)

In a case of acute tetanus treated by subcutaneous injections of Calabar bean (one-third of a grain of the extract dissolved in eighteen minims of water), the effect is thus described: "In about five minutes, the legs, which had been previously perfectly rigid and immoveable, became flaccid and freely moveable by the patient; the abdominal muscles became less tense; and the arching of the spine disappeared." The case did well. It was found necessary to repeat the injections every two or three hours, as the effects lasted only that time. At night it was found of advantage to inject along with the Calabar bean one-third of a grain of morphia. After a time the skin became so tender from the frequent injections, that it was found necessary to substitute for them suppositories containing a grain and a quarter of the extract. When administered by the mouth the effects produced were much inferior. (Mr. Ashdown, p. 66.)

TUBERCULAR MENINGITIS.—*Croton Oil as a Counter-irritant.*—Apply a liniment consisting of one part of croton oil to three of olive oil freely to the scalp. In many cases it will be necessary first to shave the head. As soon as the eruption comes out the symptoms in many cases will be relieved. (Dr. R. S. Turner, p. 367.)

AFFECTIONS OF THE CIRCULATORY SYSTEM.

ANEURISM.—*Iodide of Potassium.*—The author contributes many facts proving that iodide of potassium has in some cases the power of causing solidification of aneurisms, and in nearly all of relieving the sufferings of the patient. Out of fifteen cases great relief was afforded in fourteen, and "in a few" there has been a perfect cure. The dose given should vary from five grains to thirty, three times a day; but so large a dose as thirty grains is often not borne well. Whatever may be the explanation of its mode of action, it seems probable that it is in some measure proportionate to the amount injected, because the relief of pain, which is one of the earliest symptoms of amendment, is not produced till a certain efficient dose has been given. (Dr. G. W. Balfour, p. 198.)

DIGITALIS.—*Therapeutic action of.*—When digitalis kills, it does so not by producing paralysis of the heart, but by giving rise to tonic contraction and spasm of that organ. It is hence a a most valuable remedy in the treatment of dilatation, and dangerous only when administered in hypertrophy. When the pulse is feeble and irregular, and more especially when from any cause its feebleness and irregularity are temporarily increased, digitalis is of all known remedies the most useful. (Dr. Fuller, p. 89.)

Digitalis, like other medicines, has a double action, it first excites the vaso-motor system, contracting the blood-vessels, this action being followed by more or less reaction to dilated blood-vessels. The primary action may be obtained alone by giving small doses, the secondary by large doses. Hence when given for the purpose of checking uterine or other hemorrhages, large doses are not called for and indeed would be injurious. (Dr. A. Reith, p. 90.)

When digitalis is given in cases of heart disease, it should be in doses of about ten drops every four hours, or half a drachm of the tincture night and morning. It is not likely to benefit functional disorders or palpitation, and it is inadmissible in cases of aortic regurgitation, for in such cases it might be dangerous to slow the heart's action. Digitalis, however, may be most useful in obstructive aortic disease; but that form of disease in which it is most of all adapted for is dilatation with feebleness of action. (Dr. E. Mackey, p. 394.)

The primary action of digitalis is on the sympathetic (vasomotor) system of nerves; it stimulates this system, and so causes increase in the contractile power of the capillary vessels. It is owing to this that it relieves some local congestions. It has been of service in pneumonia; in uterine and pulmonary hemorrhage; and markedly in hemorrhoids. The first effect of a moderate dose of digitalis is to increase the rapidity of the heart's action; but this is simply owing to the capillary contraction; after from twelve to twenty-four hours the action of the heart is slowed, but not weakened. Digitalis lowers the temperature of the person taking it, sometimes even before the heart action be slowed. (Dr. E. Mackey, p. 397.)

LIGATURE OF ARTERIES.—*Antiseptic System.*—The reason that a silk ligature causes irritation, whilst a metallic one does not, is that the former contains the germs of putrefactive organisms. If a ligature be thoroughly soaked in carbolic acid, so as to destroy these germs, it may be cut off short, and left deeply embedded in a wound with perfect impunity. Ligatures should, before being used, be steeped for some time in a saturated watery solution of carbolic acid. After the wound has been freely treated with carbolic acid dissolved in forty parts of water, it may be closed as usual. The carbolic acid does not impair the tenacity of the fibre of the ligature. The most curious circumstance, and one most unexpected, is that the terminal piece of artery strangulated by the ligature is protected from putrefaction, and rendered devoid of irritating properties. Even the portion of vessel directly compressed by the ligature does not slough, but is absorbed. (Prof. Lister, p. 191.)

Mr. Maunder, of the London Hospital, has tied the carotid on the plan recommended by Prof. Lister. The ligature was soaked in carbolic acid, cut short, and left in the wound, which was closed. In one month the wound was healed, and the thread did not come away. (p. 196.)

A Substitute for the Ligature.—Dr. N. R. Smith, of Baltimore, has recently devised a little apparatus as a substitute for the ligature and acupressure in the deligation of arteries. It consists of a small silver tube, and a fine annealed iron wire passed double through the tube and projecting a loop at one extremity. The tube has a small double slit at one end. The vessel is seized in the loop, which is then drawn tight, and the ends being passed into the slits, are twisted round the end of the tube and cut off, leaving length enough to be seized by the fingers in removing it. When removed, the loop is drawn through the tube, severing the vessel as by a small écraseur. (p. 196.)

PERICARDITIS.—*Veratrum Viride.*—Veratrum viride, by its power of slowing and steadying the action of the heart, is sometimes a remedy of great value in pericarditis. In threatened rheumatic pericarditis ten drop doses of the tincture may be added to the arthritic mixture. In fully-developed cases two-grain doses of the extract should be given, with a grain of calomel, every two hours until the effects are discernible. (Dr. J. Waring-Curran, p. 97.)

PYÆMIA.—Keep the patient well under the influence of alkalies, the excretions being fully alkaline; and with this continue a full allowance of stimulants and support. Besides promoting secretion and excretion, this plan of treatment tends to prevent that first step of coagulation which, in its secondary effects, plays such an important part in the history of embolism. (Mr. C. S. Jeaffreson, p. 23.)

TORSION OF ARTERIES.—The forceps used for torsion of arteries should be rather broad at the points, and provided with fine interlocking blunted teeth. The artery should be twisted until the part seized comes off, setting the forceps free. The remaining part presents a conical twisted end, which unfurls itself to some extent, but not entirely, and remains completely closed. During the twisting the inner thick elastic coat is thrown into folds, which are crushed or squeezed together so as to block up the channel of the artery; it then gives way, and is torn through, and is held in this position by the outer coat, which resists longer. Torsion is more difficult than the ligature, requiring more care. (Dr. G. M. Humphry, p. 184.)

"Free" and "Limited" Torsion.—In "free" torsion the end of the vessel is simply clasped by a pair of forceps, and twisted freely. In "limited" torsion, before this is done, the vessel is firmly clasped transversely by another pair of forceps, about three-quarters of an inch from its divided extremity. By this means the extent of vessel twisted is limited to the terminal portion, and it is not separated from its vascular attachments for any distance. Limited torsion is more applicable to large vessels. Torsion has decided advantages over the ligature and acupressure-needle; over the former, inasmuch as no irritating substance is left in the wound; and over the latter because the permanent closure depends, like it, not only on the coagulation of blood in the vessel down to the first branch, but also upon the retraction, incurvation, and adhesion of the middle coat. (Mr. T. Bryant, p. 188.)

Torsion of Small Arteries.—It is not even necessary to twist the vessel at all if it is not of large size. If a small artery is firmly compressed by forceps for the extent of half an inch, its coats coalesce, and become mechanically agglutinated together, bleeding being effectually stopped with less injury to the vessel than by torsion. (Mr. S. Wells, p. 190.)

AFFECTIONS OF THE RESPIRATORY SYSTEM.

APHONIA.—*Electricity.*—The external application of electricity seldom restores the voice when it has been lost for any length of time, whether it result from hysteria, debility, anæmia, phthisis, or catarrhal congestion. The direct application of electricity, however, to the vocal cords, is almost always successful. In using the direct current, one pole is introduced within the glottis, and the other pole applied externally. In this way the voice is often immediately restored. The instrument employed by Dr. Mackenzie will be found fully described in the article from which this is taken. When the voice has been restored by the introduction of a pole into the larynx, the effect can often be kept up by the occasional application of the external current. This mode of treatment must be very successful indeed, for the author states that, out of two hundred cases in which he employed it, it was unsuccessful in only four. (Dr. M. Mackenzie, p. 141.)

Cod-Liver Oil.—In cases of consumption with peculiar weakness of stomach, and tendency to retching or nausea, strychnia, in a dose of from $\frac{1}{32}$ to $\frac{1}{24}$ of a grain, proves a most valuable adjunct to whatever vehicle is used. (An aromatic bitter is as good a vehicle as any.) By its means I frequently overcome the fastidiousness of stomach arising from debility, hysteria, or indulgence in alcoholic liquors. Salicine is another efficacious alterative of the same kind. Either of these, although a powerful tonic, has none of the heating properties of iron or quinine. (Dr. C. J. B. Williams, p. 112.)

Hæmoptysis.—Ergot of rye is a remedy of great value in cases of hæmoptysis arising from tuberculous disease. This arises from its remarkable power of inducing contraction of the blood-vessels. The following is the best prescription and has served its author many a good turn : ℞. Ext. ergotæ liq. ʒij (to contract the vessels) : tincturæ digitalis ʒij (to steady the heart); acidi gallici ʒj (to clot the blood); magn. sulphatis ʒvj (to relieve congestion); acidi sulphurici diluti ʒj (to assist the rest) ; infusi rosæ acidi ad ℥viij (to make a mixture.) A sixth part every three hours till hemorrhage is arrested. (Dr. H. Dobell, p. 119.)

Nasal Polypus.—*Electro-Cauterization.*—The use of the nasal polypus forceps is in the most experienced hands a bungling and uncertain mode of removing nasal polypus. By electro-cauterization and illumination of the nasal cavity, as much certainty may be obtained in the operation as in the eye, or other parts capable of inspection by vision. The operator must sit opposite the patient and illuminate the nasal cavity by the opthalmoscopic mirror. For this purpose the best light is the spirit-oxygen lime light, (fully described in this volume, p. 225). In order that the light may penetrate the nasal cavity the introduction of a spring speculum into the nostril is necessary. This speculum has two blades, one of which presses against the septum and the other distends the ala. The electric cautery is then passed down to the neck of the polypus and it is burnt through. The carrier for the platinum wire loop is so thin as not to interfere with vision. (Dr. J. L. W. Thudichum, p. 227.)

PHTHISIS.—*Inhalations.*—Remedies administered by inhalation are really useful in certain cases, chiefly those in which the larynx and trachea are much affected, and in those attended with convulsive cough or offensive expectoration. The use of inhaling instruments is fatiguing and unnecessary. A quart jug of hot water, with a napkin from over the nose down to and around the jug to confine the steam, is all that is needed. To the hot water is added the drug to be inhaled; and creasote or carbolic acid, iodine, chloroform, oil of turpentine, and juice or extract of hemlock, are the articles which I have found most useful. (Dr. C. J. B. Williams, p. 115.)

SENILE CATARRH.—*Cannabis Indicus.*—Cases of chronic senile catarrh with hacking dry cough are much benefited by the administration of cannabis indicus. It seems to soothe the irritated passages, without the disadvantages of opium. It has moreover a specific action in relieving the spasm of the bronchial muscular fibre. Twenty minims of the tincture every two hours is a suitable dose. (Dr. J. Waring-Curran, p. 140.)

TUBERCULOSIS.—The condition of body favouring the development of tuberculosis is a habit of non-digestion of fat. The causes of this habit are such conditions as diminish the consumption of, and consequent demand for, fat in the system. The appetite for, and digestion of fat are originally regulated by the amount of its combustion in the body. Hence the causes of its habitual non-digestion will be those conditions which diminish that combustion. (Dr. D. J. Brakenridge, p. 124.)

It is a well ascertained fact that the digestion and non-digestion of different kinds of food becomes habitual. Impure air, want of exercise, exposure to excessive warmth, &c., seem to cause and favour a habit of non-digestion of fat, by diminishing the demand for it in the system. In this way the tubercular state is produced. In the treatment, the indications are to break this habit, and to restore the lost power of digestion of oils. This will be best done by supplying it in increased force what we find to be the chief stimulants to the digestion of fat, *e.g.*, cold, pure air, exercise, &c., and by avoiding all that would tend to confirm the bad habit. Summer is, therefore, more to be dreaded than winter, and a cool bracing climate is preferable to a hot relaxing one. (Dr. D. J. Brakenridge, p. 122.)

AFFECTIONS OF THE DIGESTIVE SYSTEM.

Cholera.—In an interesting paper written by Drs. M'Cloy and Robertson, it is shown that only 30·45 per cent. of the cases treated with castor oil alone died, whilst 71·42 per cent. died of those treated by astringents and stimulants, camphor and iced water, applications of ice, and hypodermic opiate injections. "Diarrhœa ought not to be neglected even for an hour." We should not, however, attempt to check it by opiates or by other directly repressive means, while there is reason to believe that the bowel contains a considerable amount of morbid and offensive materials. We shall favour the recovery by directing the patient to drink copiously any simple diluent liquid—water (cold or tepid), toast-water, barley water or weak tea, and we must sweep out the alimentary canal by castor oil, then if necessary soothing it by an opiate. The opium, however, ought not to be given until the morbid poison and its products have for the most part escaped. (Sir T. Watson and Dr. G. Johnson, p. 147.)

On the first appearance of the symptoms give a draught containing from fifteen to twenty minims of chloroform, with ten to fifteen minims of tincture of opium, with a drachm of spirit to render the chloroform miscible with water. This will almost immediately relieve the cramp which ushers in the disease. If the case should progress give the following drink every hour in ounce doses: ℞. Potass. chlorat. ʒj; acidi hydrochlorici fort. ♏viij; acidi nitrici dilut. ʒiss; aquæ ℥xxiv. M. Liebig's soup should be given in small and frequently repeated doses, in order to supply the waste occasioned by the evacuations. (Dr. T. W. Lowndes, p. 24.)

Dyspepsia.—There are *three varieties* of dyspepsia: 1, The sulphuretted hydrogen dyspepsia, or that accompanied with "rotten-egg" evacuations. This requires farinaceous diet along with a mixture containing strong hydrochloric acid and chlorate of potash, filled up with a vegetable bitter. 2. The carbonic acid dyspepsia, with tasteless eructations, requiring a lean-meat diet, with avoidance of bread, potatoes, and farinaceous food generally. 3, The butyric acid dyspepsia, in which the eructations are sour and acrid. In this form the use of sugar and fat must be proscribed. A fourth form may be styled "tea dyspepsia;" this requires a daily allowance of wine, regularity of meals, and abstinence from tea. (Dr. H. Browne, p. 142.)

Gastralgia.—"There is no such remedy for gastralgia as strychnia, subcutaneously injected in doses of $\frac{1}{120}$ to $\frac{1}{30}$ grain." (Dr. F. E. Anstie, p. 378.)

HEMORRHOIDS AND PROLAPSUS OF THE RECTUM.—*The Clamp.*—Since the introduction by Mr. Henry Smith of his clamp for the removal of hemorrhoids and prolapsus of the rectum, it has been extensively tried, and gives great satisfaction. The advantages are, freedom from danger, and the short convalescence as compared with that following the use of the ligature. The hemorrhoids are seized by the blades of the clamp, cut off, and the wound freely cauterized with the actual cautery. If mucous membrane alone is removed very little pain is experienced, and it is unnecessary to give chloroform, but when skin is involved it is better to do so. Owing to the back of the blades being lined with ivory, the heat of the clamp does not cause pain by burning the skin. (Mr. H. Smith, p. 216.)

Mr. Wiblin, of Southampton, bears testimony to the great utility of Mr. Henry Smith's clamp in the removal of hemorrhoidal tumours, and to the total absence of secondary complications when this mode of operative procedure is adopted. (p. 215.)

Digitalis.—Digitalis is of use in the treatment of piles, and this owing to the primary action of the remedy being to cause contraction of the capillaries, and the secondary action slowness and power in the contractions of the heart. Hence its value in the removal of local congestions, such as hemorrhoids. The bowels must be relieved by enemata, or castor oil, and digitalis administered in say ten drops of the tincture every three hours. (Dr. E. Mackey, p. 398.)

Belladonna, etc.—In the same way as digitalis acts in cases of piles—as explained in an article by Dr. Dobell in this volume—so does belladonna. It acts through the intestinal branches of the solar plexus causing contraction of the muscular walls of the vessels of the part, and restoring tone to the paralysed muscular fibres of the colon and rectum. The stokers on board steamers are in the habit of using as an application to external piles, and with great success, the grease which runs from the hot bearings and excentrics in the engine room. It requires mixing with a little lard to form an ointment. It contains lead and copper. (Dr. J. Mulvany, p. 222.)

HERNIA.—The following plan of treating hernia with a view to its radical cure is simple and effective. Invaginate the scrotum by means of the forefinger of the left hand, well oiled, and pass a ligature by means of a long curved needle to the apex of the invagination and through the parietes. Then withdraw the needle, thread it with a fresh ligature and pass it along the dorsal aspect of the finger and through the parietes, but making it emerge at the same point in the skin as the first ligature. The needle carrying the first ligature is to be passed along the palmar aspect of the finger. After the withdrawal of the needle the second time the plug is to be pulled into the canal, the apex being firmly tied against the apex of the invagination, and the threads firmly knotted over a small piece of wood. The plug is to be left until pus flows freely from beside the ligatures. After the removal of the plug and ligatures a pad and spica bandage is to be applied, and the patient kept in bed for some days. A truss should be worn for some months afterwards, until the tissues have become consolidated. (Dr. J. Fayrer, p. 210.)

LARYNGOSCOPY.—*Dr. Thudichum's Medical Lantern.*—No oil lamp gives sufficient light for laryngoscopic purposes, however artfully contrived. Dr. Thudichum describes a simple form of apparatus by which a most intense light is producible by a jet of oxygen on a piece of lime placed in the flame of a spirit-lamp. We refer our readers to the article itself for a description of the lamp. (p. 225.)

PYROSIS.—*Sulphurous Acid.*—Sulphurous acid is a remedy of great value in the treatment of pyrosis. "In every instance in which it has been employed it has, in a very short time, completely arrested the water-brash secretion." Its good effects are probably due to the destruction of vegetable germs, which may be detected by the microscope in great abundance. (Dr. H. Lawson, p. 143.)

RECTUM.—*Lumbar Colotomy.*—The author relates some cases illustrating the advantage of lumbar colotomy in cases of intractable disease of the rectum, such as cancer and stricture. He says, "an artificial anus appears very repugnant to persons in health, but the distress which arises from frequent painful scalding motions, and from incontinency, is so great that it is not surprising that patients are willing enough to submit to this operation in order to get relief, even without any prospect of ultimate cure." The operation is very easy and simple. The incision should be transverse and carefully deepened until the colon bulges into the wound. In the case in which the operation is described there was hardly any hemorrhage. (Mr. T. B. Curling, p. 212.)

STRICTURE OF THE ÆSOPHAGUS.—The author gives an interesting case of stricture of the æsophagus, from accidental swallowing of some caustic potash. Gastrotomy was about to be performed to save the patient's life, when unexpectedly she began to improve, and in the end, although still suffering from stricture, she can swallow solids when carefully minced. This improvement did not result from bougie treatment. He remarks, "it is clear that these cases are never hopeless, and that it is quite possible that just when the last stage appears imminent, a change for the better may ensue." (Mr. J. Hutchinson, p. 207.)

AFFECTIONS OF THE URINARY ORGANS.

Abscess of the Prostate.—Abscess of the prostate is not a common affection. The symptoms are such as might be expected, the principal being pain and difficulty in micturition, or complete retention. The finger introduced into the rectum will determine the nature of the case. The abscess must be opened from the rectum as early as possible, in order to avoid its bursting into the urethra and the urine getting access to the interior of the prostate. The operation is best performed by a bistourie caché, or by a long narrow scalpel protected by adhesive plaster to within half an inch of its point. After the puncture the wound may be opened a little by the introduction of a pair of dressing-forceps closed at first, then allowed to open. A rapid recovery usually results. (Mr. C. F. Maunder, p. 262.)

Action of Acids on the Urine.—By giving alkalies you *can* render the urine alkaline, but you cannot render alkaline urine acid by giving mineral acids. Benzoic and citric acids are the only ones which do influence the reaction of the urine. The best way to give benzoic acid is in pills, as it is insoluble in water. (Sir H. Thompson, p. 249.)

Atony of the Bladder.—There is no such thing as paralysis of the bladder apart from disease of a nervous centre. But atony of the bladder, with great distension of its cavity by retained urine, and wasting and thinning of its muscular coat is common. This results usually from some slight obstruction at the neck of the bladder, perhaps by a nipple-shaped projection of a portion of prostate. The regular emptying of the bladder three or four times daily by the gum elastic catheter is the principal treatment required in these cases. For pure atony uncomplicated with prostatic enlargement, a little aid may be sometimes afforded to the patient by the application of electricity. For this purpose one pole of an electro-magnetic machine is applied to the sacrum, and the other carried into the bladder by means of a gum catheter containing a wire. (Sir H. Thompson, p. 159.)

CHRONIC CYSTITIS, OR CATARRH OF THE BLADDER.—The most common cause of this disease, which is very improperly named, is inability of the bladder, either from atony of its coats, or from prostatic obstruction, to empty its contents. It is no more a disease of itself than dropsy is. There is in this affection a great quantity of viscid mucus in the urine, and if the vessel be emptied the urine passes off first, and the mucus follows in a tenacious mass. The first thing to be done is to empty the bladder by a catheter, once, twice, or three times a day, in the easiest manner possible. If this does not succeed, the bladder must be washed out at least once a day with a little warm water before withdrawing the catheter. Never, however, under any circumstances must more than two ounces be thrown in. If this does not answer, inject the bladder daily with four ounces of warm water containing one grain of acetate of lead. After this comes the dilute nitric acid; one or two minims to the ounce of water. An injection of warm water containing glycerine and biborate of soda is a very useful one indeed. (Sir H. Thompson, p. 246.)

Of the number of vegetable decoctions and infusions recommended in chronic cystitis none is better than that of the underground stem of the *triticum repens*, or common couch grass. For use, boil two ounces in one pint of water for a quarter of an hour; the strained liquor to be taken by the patient in four doses in the twenty-four hours. (Sir H. Thompson, p. 249.)

DIABETES.—*Dilute Phosphoric Acid.*—Dilute phosphoric acid is recommended by the author as having proved of much service in the treatment of diabetes. In the case related by him he gave twenty-five drops three times a day after meals. This was seconded by the ordinary dietetic treatment of the disease, and of such remedies as iron and cod-liver oil. The patient, however, discarded everything except the acid. Under its use his thirst lessened considerably, and all his symptoms improved. (Dr. J. G. Thornley, p. 385.)

EXAMINATION OF URINE.—If you want to get a specimen of urine free from any possible admixture with products from the bladder or urethra, pass a soft gum catheter of medium size into the bladder whilst the patient is standing, and draw off his urine; then by frequent small injections of warm water completely cleanse the mucous membrane of the bladder. Now, the catheter still remaining in, permit the urine to pass, guttatim, into a test tube. You now have a specimen of urine which, for appreciating albumen, for determining reaction, and for freedom from vesical pus and even blood, and from cell-growths of vesical origin, is of the greatest value, and will often furnish you with the only data previously wanting to complete an exact diagnosis. (Sir H. Thompson, p. 256.)

Hemorrhage from the Bladder.—Besides acute cystitis, the symptoms of which are conspicuous enough, hemorrhage from the bladder can only be from stone or from tumour. As a rule, blood from a tumour is larger in quantity than from stone. If the tumour is malignant it may be felt, and the pain is often severe ; if villous, it gives an even pale red tint for days together to the urine ; and in both cases the blood is florid, unless it is long retained in the bladder, when dark sanies, like coffee-grounds results. (Sir H. Thompson, p. 252.)

Lithotomy.—*Comparative Safety of the Several Operations.*—The highest average of success in the old lateral lithotomy operation in the hands of Cheselden and other great operators has been one death in five, six, seven, or eight. In the medio-lateral operation, there is ample evidence to show that the average mortality from all operations, by whomsoever performed, is not more than one in twelve, while in some practised hands a still higher degree of security has been attained. (Dr. A. Buchanan, p. 245.)

Lithotrity.—Preliminary injection of the bladder with warm water is quite unnecessary, and it is not even necessary to ask a patient to hold his water beforehand, nor when he micturated last. If there is a small stone with a large quantity of water, you may hunt long before you find it, a proceeding which will give much more pain and uneasiness than if a small quantity of water only were present. The blades of a lithotrite do not close upon each other accurately, so that injury to the bladder by them is unlikely. (Sir H. Thompson, p. 231.)

When you have a large stone to deal with, the fenestrated instrument is the best. In this, the female blade is entirely perforated, allowing the male to pass through it. As this instrument is not so safe as the flat-bladed one, which reduces the stone to powder, it should be used as little as possible. The fragments made by the fenestrated instrument are always rough and irritating. Clover's apparatus is very useful in certain cases. For example, a patient has no power of making water, except by a catheter ; then few fragments, probably, will be passed in that way, and this apparatus is the very thing. After crushing, this large catheter is introduced, the fragments are sucked out by the action of the powerful india-rubber bottle which is attached to it. The process is rather trying, however, for the bladder; and it costs rather more pain and time than an ordinary sitting for lithotrity. (Sir H. Thompson, p. 232.)

Never attempt to drag from the bladder even a very small calculus. There is no use in injuring the neck of the bladder and the urethra by such a procedure, when by a turn of the screw it can be reduced to powder. (Sir H. Thompson, p. 232.)

Puncture of the Bladder per Rectum.—*New Trocar and Canula for.*—Mr. John D. Hill, of the Royal Free Hospital, recommends a canula containing an inner tube, so contrived that the urine does not continually dribble away, but can be drawn off at pleasure. It is evidently an improvement on the canula usually used. It may be obtained from Messrs. Weiss. (p. 264.)

Prostatic Disease.—Nothing is easier than to make a mistake in a case of prostatic disease; for instance, a patient complains that he frequently wets his bed, or loses his urine whilst walking, and yet asserts that he can make water without difficulty, and that he passes plenty of it. Nothing is more natural than that such symptoms should be mistaken for those of paralysis rather than of retention. In the case related this actually was the case, and on a catheter being passed the bladder proved to be full of urine. (Mr. J. Hutchinson, p. 260.)

Hæmaturia in Chronic Prostatitis.—A slight appearance of blood mixed with the last few drops of urine is not a rare occurrence in chronic prostatitis. (Sir H. Thompson, p. 253.)

Renal Calculus.—If we have nothing else to guide us as to the nature of a renal calculus, we may assume it to be lithic acid, as this occurs at least fifteen to one as compared with oxalate of lime. Of all medicinal remedies perhaps none are so valuable as mineral waters, especially those which have sulphate of soda, largely diluted, as the main ingredient. Of these Carlsbad is the type. Vichy water is not suitable at all, if not absolutely injurious it is at least inferior to potash. Vichy water is a strong natural solution of carbonate of soda. (Sir H. Thompson, p. 256.)

Renal Hæmaturia.—It is in renal more than in any other form of hæmaturia that direct or internal astringents or styptics are useful. Of these, perhaps none is better than infusion of matico in doses of two ounces every two or three hours. (Sir H. Thompson, p. 253.)

BONES AND JOINTS.—AMPUTATIONS, FRACTURES, DISLOCATIONS, ETC.

Abscess in the Knee-joint.—The advantage derivable in cases of abscess in important parts, from the use of carbolic acid, is well illustrated by a case of abscess in the knee-joint related by the author. He allowed the matter to escape under what Mr. Lister has termed the antiseptic veil. A paste of carbolic acid, linseed oil, one part to three, and whiting, was applied to the wound on lead paper. Slight pressure was placed on the sac of the abscess by two pads of lint, on each side of the joint, with a bandage. Next day the patient was free from pain, but no pus escaped on removing the dressings, nor did any afterwards form. The recovery was rapid and complete. (Mr. T. Hamilton, p. 171.)

Acute Necrosis.—*Antiseptic Treatment.*—A case of necrosis, showing the marvellous advantages to surgery from the antiseptic principle of treatment, is related by Prof. Lister. A lad received a severe injury to the leg, followed by abscess, and resulting in death of a portion of the tibia, as evidenced by the point of the bistoury coming against the bare bone. Various abscesses were successively opened for eleven weeks, and yet rapid recovery ensued without any exfoliation of bone, or any thickening from the formation of fresh bone. In opening the abscesses a piece of lint steeped in carbolic oil was placed over it, and the edge then raised to admit of the incision by a bistoury dipped in carbolic oil. The lint was then allowed to fall, and the matter caused to flow out beneath it. An external antiseptic dressing was then applied and changed daily. That the bone was really dead was also proved by the fact that when a probe was passed into the wound, several weeks after the first abscess was opened, it came into contact with it. (Prof. Lister, p. 194.)

Amputations.—Mr. Wharton, of Dublin, recommends a modification of the late Mr. Teale's mode of amputation. Mr. Wharton makes a single rectangular flap, the breadth of which shall be equal to half the circumference of the limb, and greater by one-fourth than its length, say, from the front aspect of the leg, and then to cut through the calf and the bones on the same plane. This, however, would be no improvement. The reason why Mr. Teale considered the short posterior to be necessary, was that "the posterior flap being made, as a rule, of the powerful flexor muscles, retracts immediately almost to the point at which the bone is to be sawn through. If, however, the posterior tissues be divided opposite the point selected for sawing through the bone, they immediately retract to a point higher up, and thus leave the posterior surface of the bone projecting and denuded of soft tissues." (Mr. Pridgin Teale, *British Medical Journal, Nov.* 7, 1868, p. 500.)

In all amputations in continuity, the patient's immunity from osteo-myelitis and subsequent pyæmic poisoning is greatly influenced by the point at which the saw is applied. The nearer to the centre of the bone this is done, the greater probably will be the chances of inflammation and disastrous sequelæ. (Dr. J. Brinton, Philadelphia, p. 170.)

Amputation at the Knee-joint.—Amputation at the knee-joint is a more successful operation than amputation at the knee, in which the bone is sawed through the condyles. This has been shown most conclusively by the statistics of the American war, and by the results of private practice in America. (Dr. J. Brinton, Philadelphia, p. 169.)

ANTISEPTIC SURGERY.—Chloride of zinc as an antiseptic application has certain advantages peculiarly its own, rendering it a more suitable application to wounds in which, from the circumstances of the part concerned, it is impossible to maintain an efficient external antiseptic dressing, so that the application must be made once for all at the time of the operation. The effects of an application of chloride of zinc are permanent, so that one application suffices. Chloride of zinc is highly valuable after the removal of portions of the maxillary bones, or of the tongue, or portions of that organ. In ordinary cases, however, carbolic acid is preferable. It is a most potent poison to the low forms of life which determine putrefaction, and its volatility causes it to exercise its properties upon other parts than those actually in contact with it. Lastly, carbolic acid is a local anæsthetic. (Prof. Lister, p. 172.)

Antiseptic Treatment of Wounds.—The oil and chalk, or putty, with carbolic acid, is rather a disagreeable mode of dressing wounds, so Mr. Lister has tried to improve the application by using emplastrum plumbi, mixed with one-fourth part of bees-wax and one-tenth part of carbolic acid. This is used as a plaster spread on calico, in a layer of about one-twentieth of an inch thick. The exact formula is given in Mr. Lister's paper. (p. 180.)

COMPOUND FRACTURE OF THE SKULL WITH DEPRESSION OF BONE.—The practice of trephining and elevation is strongly to be recommended in all cases of compound fracture with depression; but it is in order to prevent inflammatory symptoms, not to relieve any imaginary state of compression of the brain. I have never seen a case in which there seemed definite reason to think that depression produced symptoms *pe se.* (Mr. J. Hutchinson, p. 48.)

Dislocation of the Shoulder-Joint.—*Manipulation.*—The author describes a new method of reducing dislocation of the shoulder downwards. Stand with your right shoulder touching the patient's right shoulder (supposing the dislocation to be on the right side) but facing in the opposite direction to him. Now seize his right hand with your left at the same time separating his arm from the side. Then pass your right arm under his axilla, hugging the humerus. While placing your right leg behind his right leg, bring his hand underneath your right arm, with your left. Now raise the humerus forcibly upwards with your right, and bend his elbow under the same arm, pressing downwards; at the same moment direct him to fall away from you with his whole weight, and in a moment the head of the humerus will go into its proper place. (Mr. J. P. Bookless, p. 168.)

Penetrating Wounds of the Chest.—In a case of penetrating wound of the chest, the lung being injured, and hemorrhage copious, the wound should be thoroughly plugged with lint soaked in carbolic oil; the lint should be passed into the pleural cavity, so as to destroy the organic germs which have obtained access through the wound. If this is not done the blood in the pleural cavity will putrefy. The lint should be removed the next day, under the protection of a large piece of lint dipped in the oily solution of carbolic acid, and the carbolic paste should be continued to the wound externally until it is healed. (Prof. Lister, p. 174.)

AFFECTIONS OF THE SKIN.

Acne.—The following ointment produces good results: ℞. Hydrargyri iodi virid gr. x.; sulphuris ʒi.; adeps ℥i. A little oil of bergamot or bitter almonds may be added to cover the smell of the sulphur. If the inflammation in the parts becomes acute, the constant application for a few days of the "glycerole of starch" is of benefit, and in the place of soap the following may be used:—Take of glycerine, by weight, five parts, yolk of egg, four parts, mix; a little of which can also be applied before exposure to cold, heat, &c. (Dr. H. S. Purdon, p. 316.)

There is no better method of curing acne than that of Mr. Startin. It consists in destroying the inflamed sebaceous follicles by touching them with acid nitrate of mercury. The acid should be applied with a fine glass brush in minute drops to the apices of the inflamed spots. Great care should be taken not to apply too much, and any superfluous liquid should be at once absorbed with blotting paper kept in readiness. Iron or arsenic may be prescribed internally, and a bichloride lotion or mercurial ointment for house application. The use of soap must be forbidden. (Mr. J. Hutchinson, *London Hospital Reports*, p. 220.

ARSENIC IN SKIN DISEASES.—Arsenic is of no use whatever in venereal skin diseases, nor in the ephemeral and exanthematous class of affections. It is not useful in the eruptions produced by specific poisons, as many of the forms of lichen; in short in any eruption which can be traced either to a local or specific cause. With these exceptions arsenic is almost unexceptionally successful, and in all cases of chronic idiopathic affection of the skin, including lichen simplex, lichen agrius, prurigo, chronic erythema, impetigo, porrigo, alopecia, ecthyma, rupia, lepra, psoriasis, pityriasis, eczema, lupus exedens, &c., provided always, and in all cases, that it be administered discreetly, perseveringly, and with such adjuncts (purgatives, alteratives, tonics, or eliminants,) as the case may require. It may be added that it is especially useful in those cases of skin disease which depend on uterine irritation or irregularities. (Mr. T, Hunt, p. 305.)

BENZOATED OINTMENTS IN SKIN DISEASE.—No ointment or oil is suitable for application to the skin that has not been previously benzoated. (Mr. E. Wilson, p. 295.)

CARBOLIC ACID IN SKIN DISEASES.—Carbolic acid promises to prove a local remedy of great value in skin diseases, especially, of course, those parasitic in their origin. It may be applied as a lotion of the strength of half a drachm to four ounces of water Three cases respectively of chronic eczema, impetigo, and of psoriasis inveterata are related, in all of which the above application proved curative. (Dr. F. P. Mann, p. 372.)

CUTANEOUS DISEASE.—Cutaneous disease is a lowered state of vitality; in fact, a debility. We can hardly realise a case which will not get well spontaneously, if we succeed in elevating the vital power. (Mr. E. Wilson, p. 292.)

There are no such things as specifics in skin diseases. Arsenic is a neuro-tonic, applicable to every disease wherein there is loss of power of the peripheral nervous plexuses, and a consequent disorder of capillary circulation and of cell nutrition. Sulphur is simply a parasiticide in common with other substances. Tar, again, is simply a stimulant, while the bichloride of mercury is both a stimulant and caustic. (Mr. E. Wilson, p. 291.)

Although innumerable ointments and lotions have long been employed in cutaneous diseases, the active agents in all of them, with few exceptions, are not the drugs which they hold in suspension or solution, but simply the oily or watery matters which constitute the bases of these preparations. The various dry powders, such as sulphur, oxide of zinc, calamine, &c., which are mixed into ointments, give to fat a consistence which renders its action permanent, and prevents its rapidly melting, or being too readily lost or absorbed. Thus sulphur ointment is an excellent application for scabies, but the sulphur has no other effect than that of causing the follicles and grooves inhabited by the insect to be more readily blocked up. In the scaly eruptions, such as psoriasis and lepra, the admixture of pitch or tar is essential to success; but pitch pills given internally have no effect whatever. (Dr. J. H. Bennett, p. 319.)

Eczema and Moist Skin Diseases.—In all cases where there is excessive moisture on the surface, originating in vesicular, pustular, or ulcerative diseases, the constant application of water is necessary. Occasional applications are of no use whatever. For this purpose, lint well saturated in water is first applied to the affected parts. This must be covered with oil-silk. The virtue of the lotions so frequently recommended resides only in the water. The addition of a very small amount of carbonate of soda renders the water more emollient. (Dr. J. H. Bennett, p. 320.)

Favus.—There is no special virtue whatever in the various unguents which are used for the cure of favus. Simple oil, or grease of any kind, answers the same purpose. First remove the crusts by poulticing, and, secondly, keep the clear surface covered with oil. So long as this is done, the head can be kept free from disease, and if it is done long enough the case may be cured. A permanent cure cannot be effected by depilation. (Dr. J. H. Bennett, p. 319.)

Glycerine in Skin Diseases.—Glycerine is a remedy of peculiar value in certain skin diseases, from its property of assuming a semi-solid, or rather gelatinous form, when a small quantity of starch is added to it, and the mixture subjected to a temperature of 240°. (Mr. E. Wilson, p. 294.)

Glycerine of Tannin.—Glycerine of tannin is a very valuable application in a variety of trivial but troublesome complaints. These are, excoriation of the inside of the nose with discharge of a thin sanious fluid; cases of sanious or purulent discharge from the ears, so commonly met with in weak and unhealthy children; chronic vaginitis of children; eczema, in which disease the itching, tingling, and burning so commonly present are at once removed; the eczema which occurs behind the ears of children is admirably treated with the remedy. Glycerine of tannin is an extremely useful application to the throat for a variety of purposes, not during the existence of acute inflammation, but during its subsidence. (Dr. S. Ringer, *Practitioner, July* 1868, p. 27.)

HERPES.—*Neurotic Relations of.*—Cases not unfrequently occur which tend to prove that there is a reflex relation between a subcutaneous or deep-seated organ and the skin above it or in its neighbourhood, and that, owing to disease in the deep-seated organ, herpes may be caused in a part supplied by a nerve in connection with that supplying the diseased part. (Dr. H. Jones, p. 314.)

LUPUS.—*The Actual Cautery.*—In cases in which there is much swelling or hypertrophy of diseased tissue, the actual cautery rather freely applied is much preferable to the use of the fluid escharotics. The point of the iron may be thrust deeply into the tissues in some parts, and particular care must be taken to cauterize the edges of the patches. Two or three applications at intervals of a month are usually needed. The good effects must not be expected quickly; for a while the state appears to have been made worse, but after some months the advantage gained becomes apparent, and scars take the place of ulcers. (Mr. J. Hutchinson, p. 317.)

OIL AND WATER IN SKIN DISEASES.—The really active agents in the treatment of most skin diseases are oil and water. While watery applications have no effect on the dry eruptions, so greasy substances have none upon those which have fluid discharges. (Dr. J. H. Bennett, p. 322.)

PORRIGO FAVOSA.—*Iodide of Sulphur.*—After softening and detaching the crusts by the application of linseed-meal poultices, let an ointment composed of iodide of sulphur one drachm, and lard an ounce and a half, be well rubbed into the diseased patches night and morning. This will probably answer better than the use of sulphur or citrine ointments. (Dr. D. Donovan, p. 312.)

PRURIGO.—Nearly all cases of prurigo arise from the pediculus corporis. This insect differs from the other two species, which infest respectively the head and the pubes, in that it dwells on the under-clothing, and also deposits its eggs on the under-clothing. Hence if the skin is ever so carefully examined nothing is discovered, and even the shirt requires great care to discover the cause of the affection. The nits are often found in the inside of the wrinkles or folds about the waist. Warm baths and washing the clothes have no effect whatever in killing the parasite. The only way to destroy the ova in the clothes is to bake them. It is also a good plan to grease the skin with very dilute citrine ointment (unguentum hydrargyri nitratis), or indeed with any greasy substance, and this for the same reason that olive oil or lard, *per se*, is a cure for the itch. An ointment containing the oil obtainable from stavesacre seeds is a capital application, better indeed than the citrine ointment. (Dr. B. Squire, p. 307.)

Pruritus of the Skin.—No remedy is better than creosote mixed with ten times its bulk of oil. (Dr. J. H. Bennett, p. 319.)

VENEREAL AFFECTIONS.

Constitutional Syphilis.—*Calomel Vapour Bath.*—The calomel vapour bath, when properly administered, produces all the therapeutical actions which can be produced by mercury, without any of its bad effects. For this reason its use is admissible in states of great debility. The effect of the bath is increased when the vapour is inhaled, but inhalation alone does not produce satisfactory results. A drachm of calomel should be used for each bath. The patient should be sweated moderately, and kept in the bath from twenty-five to forty-five minutes. As a rule, a course of baths extends over a period varying from six weeks to two months. Salivation never occurs. Swelling and tenderness of the gums, however, testify to the action of the remedy. As a rule, patients improve in appetite, and increase in weight during the treatment. (Mr. H. Lee, p. 163.)

Syphilitic Ulceration of the Throat.—*Sulphurous Acid Spray.*—Dr. Purdon, of Belfast, relates a case of intractable syphilitic ulceration of the throat which healed in three weeks under the use of sulphurous acid spray. It had resisted other remedies for three months. (p. 389.)

AFFECTIONS OF THE EYE AND EAR.

Abscess of the Lacrymal Sac.—If after the nasal duct is patent the cure is not spontaneous, the best plan of treatment is to slit up the lower canaliculus, and apply a weak solution of nitrate of silver to the interior of the sac once or twice a a day, washing out the sac with injected water a few times during the day. (Mr. J. Z. Laurence, p. 278.)

Atropine.—As a sedative to the eye, atropine, as a very occasional thing, not only entirely fails, but acts as a direct irritant, and may even produce the most acute and troublesome symptoms. These effects cannot be accounted for by the small amount of free acid present in the solution of atropine used, for we daily use in ophthalmic practice salts which contain much more free acid than the sulphate of atropia, without the production of such symptoms. It is singular that in some cases in which atropine produces symptoms of acute irritation, belladonna can be used without any ill effects. A second group of symptoms which may be caused by atropine is an erysipelatous condition of the eyelids and surrounding integuments, with redness and chemosis of the conjunctiva. (Mr. G. Lawson, p. 282.)

Depression of Cataract.—Depression of cataract has fallen quite out of fashion, but it compares favourably in its results with the newer operations. It is applicable to all kinds of cataract whether hard or soft; the consecutive accidents are less serious and less dangerous than those which follow extraction; and lastly, should the operation, in consequence of some accident, fail, it can be repeated twice or thrice, without danger, on the same eye. In performing the operation, the anterior capsule must be opened out widely, as otherwise a secondary capsular cataract is liable to form. This must be done before the lens is depressed and sunk, a otherwise the capsule is too yielding to be easily incised. In sinking the lens the breadth of continuity in the anterior capsule is much widened, and reunion is impossible. A cataract of soft or cheesy consistence may be broken up with the needle, the nucleus only being sunk in the vitreous. A hard cataract must be sunk by a pretty quick, but delicate, movement of the needle, so that it becomes buried in this humour, without coming into contact with the bottom of the chamber, on which it would act like a foreign body. (Prof. Quaglino, p. 274.)

Foreign Bodies in the Ear.—The best way to remove foreign bodies from the ear that I know of is by the use of a loop of wire. It is free from risk, which the use of the scoop is certainly not. (Mr. J. Hutchinson, p. 290.)

Pass a small piece of india-rubber tubing down to the foreign body, so as neatly to adjust it to its surface. Then by means of a syringe inserted in the free end of the tube make gentle suction by drawing out the piston rod. This method requires some practice, and nice manipulation in order to insure success. When the foreign body is spherical it may often be removed by a rolling-out plan. For this purpose slightly turn the point of a curved suture needle so that when the finger is passed along the concave surface it detects a slight "burr." Pass this between the foreign body and the wall of the meatus, and in pulling it forwards catch the foreign body with the point of the needle so as to cause it to roll somewhat outwards. This process must be repeated until it is extracted. (Mr. A. G. Brown, p. 288.)

Hypermetropia and Myopia.—How may we detect by means of the ophthalmoscope that the eye is abnormal as to length? Whenever, without the object-lens, any of the details of the fundus—vessels, disc, patches, &c.,—are easily seen, we may be quite sure that the globe is either too long or too short, or that the lens is wanting. If these objects are seen very easily, and the image very bright and beautiful, then, in all probability, it is an inverted image, and the eye is myopic. If only large trunks of vessels have been seen, and these not easily kept in view, then probably it is the erect image, and the eye hypermetropic. (Mr. J. Hutchinson, p. 269.)

Iritis and Threatened Glaucoma.—The hypodermic injection of atropine appears to promise the most valuable results in painful iritis, and especially in threatening glaucoma. "I firmly believe that in two cases I have succeeded in preventing the latter affection from developing itself; at least the most threatening symptoms were present, and rapidly subsided under the use of one-sixtieth of a grain injections of sulphate of atropine." (Dr. F. E. Anstie, p. 378.)

Lacrymal Disease.—Undoubtedly the proper cure for lacrymal disease is removal of the lacrymal gland. The distressing epiphora (watering) ceases, and this results whether the whole or a part only of the gland is removed. It is not found that the eye becomes dry. The moisture and lubricity of the conjunctiva remains unaffected. (Mr. J. Z. Laurence, p. 277.)

Opacities of the Cornea.—Evert the upper eye-lid, and brush a grain or two of sulphate of soda lightly over the surface with a camel-hair pencil. The application may be repeated every or every other morning, or twice a week, according to the reaction that follows. After the continued use of the remedy for some weeks, the opacity is observed to become fainter. In some cases, when the reaction produced by the introduction of the pure salt is too violent, it may be allayed by the addition of a little starch. (Dr. H. Power, p. 286.)

OPACITIES OF THE LENS.—The catoptric test is now rendered quite obsolete, for by means of oblique illumination, a far easier and more certain thing, any one of the slightest skill can determine at a glance the condition of the patient's pupil and of his crystalline lens. The least possible streaks of an incipient cataract become by its aid conspicuously definite. A candle and a two inch convex lens are the only things required. The pupil should be dilated with atropia, and the candle having been placed to one side the patient's head, the lens is held so as to receive its light and concentrate it to a pencil, which is thrown upon the patient's eye. All the superficial parts may thus be brilliantly lighted up. (Mr. J. Hutchinson, p. 265.)

OPHTHALMIA.—*Chloride of Zinc.*—Chloride of zinc used in a solution of two grains to the ounce is a capital astringent application in certain forms of ophthalmia. It is suited for the same class of cases that we use nitrate of silver or alum for, *i.e.*, the catarrhal or purulent. It is less painful than nitrate of silver, and may be used freely to the youngest infant. (Mr. J. Hutchinson, p. 285.)

OPHTHALMIA TARSI.—*Epilation.*—By far the quickest mode of cure is by the careful and complete removal of the hairs. In bad cases two or three removals, at intervals of two weeks, are necessary. The hairs grow again very quickly. The disease consists of a chronic inflammation of the hair-sheaths of the eye-lashes and of their proper glands. (Mr. J. Hutchinson, p. 282.)

OPHTHALMOSCOPY.—Always proceed systematically. Examine the eye first without the object-lens, and ascertain the state of the cornea, lens, and vitreous. No mistake is easier to make or more frequently made, than by the immediate employment of the inverted image to overlook the fact that the media are not perfectly transparent. (Mr. J. Hutchinson, p. 269.)

In examining the right eye direct the patient to look over your left shoulder, not full in your face ; and when examining the left eye he must look over your right shoulder. (Mr. J. Hutchinson, p. 268.)

SETONS IN EYE DISEASES.—The author says that he has of late years formed a still higher opinion of the efficacy of setons in the treatment of certain chronic affections of the cornea than he formerly held. Chronic ulcerations of the cornea attended with much intolerance of light are the cases which require them. They should be placed amongst the hair of the temple, so as not to be seen, and that no visible scar may be left. (Mr. J. Hutchinson, p. 286.)

MIDWIFERY, ETC.

DEBENHAM'S WHALEBONE FILLET.—Mr. R. K. Debenham describes a whalebone fillet which is likely to be of considerable use in cases of lingering labour—cases hardly calling for the use of the forceps. It is soft and pliant, and easily carried in the pocket. It consists of two long loops of whalebone interlaced, the free ends terminating in handles similar to forceps, but shorter, a peg being attached to lock them when required. The loops are ten inches long by three-quarters of an inch wide. In adaptation it is like the fillet, being passed over the chin or occiput. To apply it the blades are pressed together side by side beneath the head, like the lower blade of the forceps. The posterior blade is now swept round the head, and brought opposite its fellow. This requires a little careful manipulation. (p. 341.)

HYSTERIA.—*Local Anæsthesia of.*—In the cases of local anæsthesia apt to occur in hysteria, the application of the electric brush (made of fine wire) is the best remedy. A pretty strong induced current should be passed along it. (Mr. J. N. Radcliffe, p. 58.)

HYSTERICAL VOMITING.—There is undoubtedly a form of vomiting which is hysterical in its nature. To cure it we must cure the hysterical state; for remedies directed to the stomach are almost useless. (Dr. H. Salter, p. 351.)

INCONTINENCE OF URINE IN CHILDREN.—Incontinence of urine occurs in two classes of children—the excitable, restless child, and the stupid and listless child. In the first case, remove as much as possible the sources of over mental stimulation, procure country air, and administer steel wine and cod-liver oil. In the second class avoid punishment, which only stupifies the child more, and try to develop the mind as much as possible. Belladonna is by far the best remedy in these cases, and indeed has a most marked effect. After it nux vomica may be tried. (Sir H. Thompson, p. 161.)

There are cases in which incontinence of urine is the principal, if not only, symptom, for no disease of the passages or of the bladder otherwise than contraction can be found. The proper treatment is to distend the bladder as much as possible with plain warm water, so as to stretch the contracted muscular fibres. In some cases an injection of morphia is of service. (Dr. B. Hicks, p. 363.)

IRRITABLE UTERUS—"Irritable uterus" is nothing more nor less than retroflexion of the uterus of a marked form, and the symptoms can be made to disappear and the patient restored to comparative—often to perfect—health, by remedying the defect and by restoring the uterus to its proper shape. The retort shape of the uterus may always be detected by careful examination. The most satisfactory method of treatment consists in the application of pressure behind the cervix uteri, maintaining the cul de sac of the vagina behind the cervix in a high position in the pelvis. A modification of Hodge's pessary answers this purpose very completely. The upper part of the ring prevents the descent of the fundus backwards, and by degrees the flexion is rectified. (Dr. G. Hewitt, p. 357.)

New Uterine Douche.—Dr. Hermann Beigel recommends a new form of uterine douche. Its mode of operation will be seen at once by referring to the woodcut at page 353.

Ovarian Neuralgia.—In cases of ovarian irritation or neuralgia give an eight-ounce mixture containing two drachms of the muriate of ammonia, with five-drop doses of tincture of aconite. This combination of remedies has sometimes a most marked effect in causing the subsidence of the pain. (Dr. J. Waring-Curran, p. 360.)

Puerperal Convulsions.—The opinion has been very strong that manual or instrumental interference in cases of puerperal convulsions, even to the extent of assisting the dilatation of the os by the finger, is prejudicial. This is quite erroneous. Before labour has really set in, such remedies as chloroform, and in some appropriate cases venesection, are the most reliable remedies; but after the commencement of labour, instrumental interference is sometimes called for, and may with safety be resorted to. (Dr. J. Cappie, p. 324.)

Speculum Uteri.—For vaginal fistula, and other explorations in this neighbourhood, Weiss & Co. have constructed a new kind of duck-bill speculum, which holds itself in position while the practitioner is exploring or operating. (See woodcut, p. 323.)

Turning in Contracted Pelvis.—The truth of the proposition that "The head will come through the pelvis more easily if drawn through base first than if by the crown first," becomes only more evident by the results of further experience. The accoucheur may fail to extract a head by the forceps, when, if he turns the child, it will slip through with ease. If the child passes more easily, it follows that turning in these cases offers a better chance of life than the forceps. (Dr. R. Barnes, p. 335.)

Turning when the Uterus is firmly contracted upon the child.—In all dorso-anterior positions, lay the patient on her left side; pass your left hand into the uterus—it will pass most easily along the curve of the sacrum and the child's abdomen; *your right hand is passed between the mother's thighs to support the uterus externally.* In the case of *abdomino-anterior positions, lay the patient on her back, and you may introduce your right hand, using the left hand to support the uterus externally.* If the patient is supported in lithotomy position, you can thus manipulate without straining or twisting your arms or body. But it is equally easy to use the left hand internally if the patient is on her back, so that the exception is only indicated to suit those who have more skill and confidence with the right hand. (Dr. R. Barnes, p. 330.)

UTERINE DISEASE.—*Carbolic Acid.*—Carbolic acid is an excellent local application in the same class of cases of uterine disease which are ordinarily treated by the application of solution of nitrate of silver. It is applied in the same manner as the latter, with the precaution of being careful not to allow the acid to touch the vaginal mucous membrane. As a caustic it occupies an intermediate position between nitrate of silver and the more powerful corrosive caustics. More energetic than it, it is at the same time free from the danger to neighbouring structures which attend the use of the more potent caustics. Although its action does not penetrate below the diseased surface, it possesses great power of changing the vitality of tissues, and produces rapid cicatrization, dissipates inflammation and hypertrophy, and relieves pain. (Dr. D. L. Roberts, p. 356.)

UTERINE HEMORRHAGE.—Digitalis if given in full doses induces violent uterine contraction, and checks uterine hemorrhage. Its action in this particular is permanent, and probably depends upon its causing contraction of the capillaries. (Dr. Dickenson and Dr. Reith, p. 91.)

VAGINAL ATRESIA.—Closure of the vagina, not amounting to an imperforate condition, should be treated by dilatation by tents. An illustrative case by Dr. Murray, of Newcastle, will be found at p. 351.

MISCELLANEA.

ALCOHOL.—*Effect on the Tissues.*—It is remarkable how many morbid processes resemble those which naturally take place in advancing age, and thus a disease will, by its effects, add so many years to a person's life. This is particularly well illustrated by the effects of drunkenness on the tissues, all of which are liable to more or less degeneration. We may have by an increase of the fibrous or connective tissues, a cirrhosis of the liver, a Bright's kidney, or a so-called chronic pneumonia. Fatty degenerations are perhaps more common than fibrous, and thus death by diseased heart is very frequent. The effects on the brain are however the most striking, the convolutions becoming shrunken and the interspaces filled with water, in fact the brain of second childhood. (Dr. S. Wilks, p. 48.)

ANIMAL VACCINATION.—It is not necessary in out of the way parts of the world to keep up the standard of vaccine virus by importations from England or other parts of Europe. All that is necessary is to inoculate a cow by two inoculations on either side of an udder. Several superficial incisions, or rather scratches, should be made, on the soft skin between the udder and the teat choosing a part free from hairs, and unaffected by the slight cracks which appear to attack this locality. Lymph may be drawn from the pustules just before they are ripe, by means of capillary tubes. (Mr. W. H. Stone, p. 386.)

ARSENIC.—As a poison the action of arsenic is depressing in the extreme ; as a medicine it is tonic and invigorating, excites moderately the action of the heart and arteries, quickens the appetite, promotes digestion, often cures intermittents, and has been known to cure epilepsy. After it has been taken for a period of two weeks or more, there occurs a sense of warmth in the extremities, and a general feeling of improved health and invigoration. Some patients become plump under such a course, and thus feel in high spirits, and are conscious of an improved appetite. After a period of nine months the epithelial scales of the palms of the hands and the soles of the feet become, in some cases, slightly thickened or corny, and in persons of fair complexion a slight scurfiness of the skin in parts protected by the dress occurs. This account is given from an average of fifteen thousand cases, some of whom took the medicine continuously for seven years. Arsenic is not a cumulative remedy. (Mr. T. Hunt, p. 302.)

BROMIDE OF MERCURY.—A less dose of bromide of mercury is generally required than of calomel, and it acts more agreeably and effectually both as a cholagogue and purgative, without the depressing results so often observed to follow the exhibition of calomel. It is useful in promoting the absorption of hypertrophied glandular and other morbid tissue with less constitutional disturbance than the chloride. It may frequently be administered with benefit in cases of biliary congestion of the liver, in chronic hepatitis with enlargement, and in those skin diseases which yield best to the influence of mercury. (Dr. P. Smith, p. 384.)

NITROUS OXIDE AS AN ANÆSTHETIC.—Nitrous oxide will probably come into more general use as an anæsthetic. It may be obtained (of Mr. Barth, 26, Duke street, Bloombury square) in small wrought-iron bottles, containing fifteen gallons of compressed gas, which can be drawn off in any quantity for immediate use. It may easily be administered from an india-rubber bag with an elastic tube, which can be attached to the ordinary mouthpiece connected with the late Dr. Snow's chloroform-inhaler. (Mr. W. A. N. Cattlin, p. 382.)

RELATION OF FOOD TO WORK.—If the work to be performed is uniform and continuous, farinaceous and fatty food is required; if it be severe, but for a short period, animal food in considerable quantity is demanded. The preference amongst mankind for the suitable kind of diet is instinctive. Thus the Lancashire labourer uses fat and flour, whilst the American Indian is almost purely carnivorous. The Cornish miner who feeds on dough and fat, and does his work well on that, find himself greatly distressed by the climbing of the ladders at the end of his day's work. If he took more meat this would probably not be the case. (Prof. Haughton, p. 5.)

SNAKE-BITE.—*Arsenic.*—The use of arsenic in cases of snake-bite, as recommended by the author, in the second volume of the Medico-Chirurgical Transactions, has not had the attention it deserved. His plan was to administer two drachms of liquor arsenicalis, equal to one grain of arsenic, with ten minims of laudanum, and an ounce and a half of peppermint water, in combination with half an ounce of lime-juice every half-hour for three or four hours; at the same time ordering a cathartic glyster every hour; and after paring the edges of the wound, fomenting it, and then applying a liniment, consisting of spirits of turpentine, liquor ammoniæ, and olive oil. In three or four hours purging was established and the arsenic was stopped. (Mr. Ireland, p. 381.)

PRACTICAL MEDICINE.

DISEASES AFFECTING THE SYSTEM GENERALLY.

ART. 1.—ON AN EPIDEMIC OF TYPHOID FEVER.

By Dr. ROBERT PERRY, Physician to the Glasgow Royal Infirmary.

[During March 1868, Dr. Perry's attention was directed to the existence of an epidemic of typhoid fever in the neighbourhood of the Garnkirk Fire-Clay Company's works, by the admission under his care into the Glasgow Royal Infirmary of five cases of that disease. The cause of the epidemic, having been investigated, was removed. The origin and mode of propagation of typhoid in isolated places such as this is, are always more instructive and consequently more interesting than they are in large towns.]

I may state, for the information of those who are unacquainted with the situation and surroundings of the Garnkirk Fire-Clay Works, that they are situated at about six miles from Glasgow, immediately on the line of the Caledonian Railway, from which a line of rails enters the works for the purposes connected with the manufacture of the fire-clay bricks, tiles, and many other articles, which are noted over the whole globe for their superior quality. Directly adjoining the works, and on ground rising somewhat towards the north and west, are a number of cottages inhabited by the work-people and their families. The entire population of the surrounding houses may be roughly estimated at between 600 and 700. Beyond the workmen's cottages, and extending on every side, is an undrained moss, beneath the surface of which the famous fire-clay is found. With the exception of one or two small farm-houses and some pitmen's cottages, there are no other dwelling-houses within nearly a mile of the works. On the north side of the kilns and workshops, and surrounded almost on three sides by the cottages, is a large pond or reservoir of water for the use of the works and workpeople. This reservoir is supplied with water from an adjoining clay-pit, the shaft of which is situated about 500 yards distant. The water is pumped out of the pit, and conveyed to the reservoir through fire-clay pipes, which are embedded only to a very slight depth in the ground. The number of men at work in the pit at the date of my inquiry was about fifty, and at that particular time the number was much less than the average of those who usually found employment there. I ascertained that there were no privies in the pit, and that the pitmen were in the habit of passing their evacuations, when necessary, at any convenient part of the workings. From the clayey nature of the floor of the pit, it can readily be understood that little or no absorption takes place, and the whole drainage of the pit gravitates to the bottom of the shaft, whence it is pumped up, and the water so collected passes through the before-mentioned pipes to the reservoir. The greater part of the surface drainage from the ground surrounding the cottages, as well as the sewage and waste water from the houses, is intercepted before reaching the reservoir, and carried off by open surface drains running parallel with it, and those open drains are regularly swept and kept clean. At the end of the pond, however, at which the water supply pipe is led in, I observed a considerable quantity of sewage and surface drainage finding their way into the reservoir. From this fact, and judging from the general appearance of the water in the reservoir, there could be no doubt of its being largely contaminated with sewage and putrefying matter; but, on the other hand, there is no proof that the water taken directly out of the reservoir is ever employed for drinking or cooking. At the back and side of the row of cottages, immediately adjoining where the conducting pipe passed, I observed that the ground was thickly studded with human excrement, and refuse thrown out from the houses, the privies and dungsteads being somewhat deficient there. Workmen were, however, engaged in preparation for building them, and I understand that the deficiency has since been supplied.

In addition to other measures recommended, I advised that the joints of the conducting pipe in the neighbourhood of the cottages should all be carefully examined and made secure. I have since been informed that when this was done, one of the fire-clay pipes at this particular part was found to be broken, and, moreover, that the surface water from the ground to which I have just referred was seen to flow into the broken pipe.

Here, then, was a clear proof of the impure and unwholesome state of the water passing through the pipe; and as all the water for domestic use was drawn from this pipe as it falls into the reservoir, seeing there is no other source of supply, we need feel no surprise at the outbreak of enteric fever which took place amongst those who made daily use of it. I regret that I have not been enabled to make out the exact amount of impurities in either the pit or reservoir water by an accurate chemical analysis. I requested a specimen of the water to be sent to me for the purpose of analysing it; but my request was not complied with.

Throughout the cottages adjoining the works there had occurred during the past month, and up to the date of my visit, about forty-five cases of enteric fever (without being strictly accurate as to numbers). A few of the cases had been removed to the Glasgow Royal Infirmary; but the majority were under treatment in their own homes. There was also one patient suffering from enteric fever in a cottage on the opposite side of the railway, and situated only a short distance from the works; and it is an interesting fact to note that the inmates of this cottage derived all their water-supply from the same source as the people in the works.

Mr. Murray also mentioned to me that he had at that time one patient suffering under the same fever in the village of Chryston, which is nearly two miles from Garnkirk; but that up to the time of his seizure he was employed in the fire-clay works. I was not able to hear of any cases of the disease among the workmen of the same company who resided at a place called Crow-row, less than half a mile distant from Garnkirk, but which is supplied with water from a different source.

It is worthy of remark, that the proprietors of the works have for years been in the habit of furnishing, gratis, a filter for the use of the inmates of each cottage. Only a few, however, of the householders availed themselves of this offer; and it is somewhat remarkable that I did not find a single case of fever in any of the houses where the water was regularly filtered before being used for drinking or culinary purposes. Mr. Murray subsequently informed me that one or two cases did occur among those who used the filters; but that the proportion of those attacked in the houses where filters were in use was very much smaller than among those who used the water unfiltered.

Very shortly after the adoption of the measures recommended for the prevention of the contamination of the water, a marked diminution in the number of individuals attacked was observed to take place. In about a month after, the fever was almost eradicated, there being only five or six cases, and those of a much milder type, and principally confined to children. There were in all above sixty individuals attacked, and amongst these the proportion of fatal cases was very small. At the commencement of the epidemic the type of the fever was somewhat indefinite. Bronchial symptoms were more prominent than enteric symptoms, and several of the patients were sent into the general medical wards of the Glasgow Royal Infirmary as cases of bronchitis. In a short time, however, the abdominal symptoms became more decided, and the characteristic diarrhœa, which was altogether absent in many of the earlier cases, soon assumed a very severe form.

I endeavoured to trace out the history of the first case of enteric fever that had occurred at the works, and likewise if any connexion could be discovered between the first and the succeeding ones. A rumour was mentioned to me of two men having recently come to the works who were at the time suffering from, or were immediately after attacked by, the fever. On strict inquiry, however, I was not able to find any foundation for this rumour.

Whether the germs of the disease were introduced from without, or originated *de novo* in some of the individuals who were using the water contaminated as I have pointed out, is not in this instance able to be proved beyond doubt. It is certain, however, that the very first case occurred in one of the cottages in the row immediately adjoining where the pipe conducting the water passed, and where I before mentioned that the privies and dungsteads were deficient.

If, as is more than probable, the intestinal discharges from this first case found their way into the pipe, the propagation of the fever by this means was most certain; and if the manager had not promptly carried out the recommendations for the suppression of this and the other likely sources of its propagation, there is but little boubt that the consequences would have been much more disastrous.—*Lancet, June* 6, 1868, *p.* 718.

2.—THE FUNGUS THEORY OF DISEASE DOUBTFUL.

In a short communication to the *Centralblatt*, Drs. Bergmann and Schmiedeberg describe a crystalline substance, to which they have applied the name "sulphate of sepsin," obtained from putrefying materials, and which they believe represents the proper poison of organic substances undergoing this kind of fermentation. It is obtained by diffusion through parchment paper, precipitation with corrosive sublimate from an alkaline solution, removal of the mercury by silver, of silver by sulphuretted hydrogen, evaporation, and purification of the residue. Large well-defined, acicular needles are thus obtained, which are deliquescent in the air, and, exposed to heat, melt and carbonise. They possess a powerfully poisonous action. A solution containing scarcely more than one-hundredth of a gramme was injected into the veins of two dogs. Vomiting was immediately induced, and after a short time diarrhœa, which in the course of an hour became bloody. After nine hours the animals were killed, and on examination their stomachs and large intestines were found ecchymosed and the small intestine congested. Frogs could be killed in the same manner.—*Lancet, Oct.* 17, 1868, *p.* 518.

3.—ON THE RELATION OF FOOD TO WORK DONE IN THE BODY.

By the Rev. Dr. S. Haughton, F.R.S.

[About two years ago Drs. Fick and Wislicenus, of Zurich, published an article in the Philosophical Magazine, founded upon an examination of urine secreted during an ascent of a mountain. This paper proved that the force due to the urea excreted in a given time is not sufficient to provide the actual work that may be done by the muscles in the same time.]

Liebig and his followers, misled by a preconception of the simplicity of nature, assigned to nitrogenous food the duty of providing the force necessary for the production of muscular work, by supplying the waste of muscular tissue; while they supposed the farinaceous and fatty foods to provide the amount of animal heat required by the body.

The opponents of Liebig have fallen into the opposite error, and deny that nitrogenous food contributes any portion of the force employed in muscular work.

The truth, as is usual, lies between the two extreme hypotheses, and we are now compelled to admit that a given development of force, expressed in animal heat, muscular work, and mental exertion, may be the effect of several, perhaps many, supposable supplies of digested food, farinaceous, saccharine, fatty, and albuminous.

Just as a given algebraical function may be equated to a given constant, by the use of a certain definite number of values of its variable quantity, so may a given effect of work in the animal body be produced by certain definite, though very different, combinations of various kinds of food, the digestion of which follows each its own law, and developes its own amount of force. The number of roots in our equation of life increases the difficulty of solving it, but by no means permits the acceptance of the lazy assumption that it is altogether insoluble, or reduces a sagacious guess to the level of the prophecy of a quack.

Lavoisier supposed in his earlier investigations that animal heat was developed by the combustion of carbon and hydrogen in the lungs, just as in earlier times it was supposed to be produced spontaneously in the heart, which was imagined to be so hot as even to burn the hand that should imprudently venture to touch it.

In like manner, Liebig and his followers supposed the muscular work to be developed in the substance itself of the muscles that were its instruments.

Both of these doctrines are now justly repudiated by physiologists, and the view proposed in 1845 by Dr. Mayer, of Heilbronn, and recently developed with much ability by Mr. C. W. Heaton, of Charing-cross Hospital, in the Philosophical Magazine for May, 1867, that the blood itself is the seat of all the chemical changes that develope force in the body, has gained favour among physiological chemists, and also met with acceptance among practical clinical observers.

Thus the human mind revolves in cycles, and the physicians of the nineteenth century are preparing to sit at the feet of Moses, and learn that the blood of an animal really constitutes its life, while South African theologians reject his authority, because he happened to confound a Rodent with a Ruminant.

No two classes of animals can well differ more from each other than the cats and ruminants, one of which is intended by nature te eat the other. They differ in all respects as to food, the cats requiring a supply of fresh meat and blood for their health, and the ruminants being exclusively vegetable feeders ; yet in both classes we find a great development of muscular power and of rapid action of the muscles, qualities alike necessary to the pursuer and to the pursued. There can be no doubt that muscular work is developed in the cats from the combustion of flesh, and in the ruminants mainly, if not exclusively, from farinaceous food. It is, however, worthy of remark that the muscular qualities developed by the two kinds of food differ considerably from each other. The hunted deer will outrun the leopard in a fair and open chase, because the work supplied to its muscles by the vegetable food is capable of being given out continuously for a long period of time ; but in a sudden rush at a near distance the leopard will infallibly overtake the deer, because its flesh food stores up in the blood a reserve of force capable of being given out instantaneously in the form of exceedingly rapid muscular action.

In conformity with this principle, we find among ourselves an instinctive preference given to farinaceous and fatty foods, or to nitrogenous foods, according as our occupations require a steady, long-continued, slow labour, or the exercise of sudden bursts of muscular labour continued for short periods. Thus chamois hunters setting out for several days' chase provide themselves with bacon fat and sugar ; the Lancashire labourers use flour and fat, in the form of apple dumplings ; while the Red Indian of North America almost transforms himself into a carnivore, by the exclusive use of flesh food ; he sleeps as long, and can fast as long, as the puma or jaguar, and possesses stored up in his blood a reserve of force which enables him, like a cat, to hold his muscles for hours in a rigid posture, or to spring upon his prey, like a leopard leaping from a tree upon the back of an antelope.

If the preceding view of the muscular qualities developed by the two kinds of food be correct, important inferences suggest themselves as to the food that should be employed in relation to several kinds of work. Of these inferences, I shall select two examples :—

1. The nurses of one of our Dublin Hospitals were formerly fed chiefly upon flesh food and beer, a diet that seemed well suited to their work in ordinary times, which was occasionally severe, but relieved by frequent intervals of complete rest. Upon the occasion of an epidemic of cholera, when the hospital duties of the nurses became more constant, although on the whole not more laborious, they voluntarily asked for bacon fat and milk, as a change of diet from the flesh meat and beer; this change was effected on two days in each week with the best results as to the health of the nurses, and as to their power of discharging the new kind of labour imposed upon them.

2. I have been informed, on competent authority, that the health of the Cornish miners breaks down ultimately, from failure of the action of the heart and its consequences, and not from the affection of the lungs called "miner's phthisis." The labour of the miner is peculiar, and his food appears to me badly suited to meet its requirements. At the close of a hard day's toil, the weary miner has to climb by vertical ladders through a height of 100 to 200 fathoms before he can reach his cottage, where he naturally looks for his food and sleep. This climbing of the ladders is performed hastily, almost as a gymnastic feat, and throws a heavy strain (amounting from one-eighth to one-quarter of the whole day's work) upon the muscles of the tired miner during the half-hour or hour that concludes his daily toil. A flesh-fed man (as a Red Indian) would run up the ladders like a cat, using the stores of force already in reserve in his blood; but the Cornish miner, who is fed chiefly upon dough and fat, finds himself greatly distressed by the climbing of the ladders—more so indeed than by the slower labour of quarrying in the mine. His heart, over-stimulated by the rapid exertion of muscular work, beats more and more quickly in its efforts to oxidate the blood in the lungs, and so supply the force required. Local congestion of the lung itself frequently follows, and lays the foundation for the affection, so graphically, though sadly, described by the miner at 40 years of age, who tells you that "his other works are very good, but that he is beginning to leak in the valves."

Were I a Cornish miner, and able to afford the luxury, I should train myself for the "ladder feat" by dining on half a pound of rare beefsteak and a glass of ale from one to two hours before commencing the ascent.

Application of Theory to Diseased Conditions of Body.—The relation of food to work, complicated enough in health, becomes more so in disease, and the problem to be solved by rational theory becomes still more difficult. I cannot attempt even to sketch an outline of this part of my subject, considered in general, but shall content myself with asking your attention to three remarkable examples of disease which illustrate the principles I have attempted to lay down.

These diseases are—

A. Typhus Fever.
B. Cholera Asiatica.
C. Diabetes mellitus.

A. *Typhus Fever.*—In typhus fever a prominent symptom is the remarkable elevation of temperature, accompanied by an increased excretion of urea and carbonic acid by the kidneys and lungs, indicating (as no food is taken) an increased morbid metamorphosis of the blood and tissues. The temperature frequently rises to 104° Fahr., representing an increase of upwards of 5° Fahr. above the normal temperature.

If we knew the cause of this increase of temperature, or rather of the increased metamorphosis of which it is the sign, we should know the cause of typhus fever, and learn to combat the disease on rational grounds. At present the cause is unknown, therefore the physician is forced to treat the symptoms as they appear, instead of attacking the cause of the disease. Let us examine for a moment the terrible significance of the symptoms.

Your patient lies for nine or ten days, supine, fasting, subdelirious, the picture of weakness and helplessness ; and yet this unhappy sufferer actually performs, day by day, an amount of work that might well be envied by the strongest labourer in our land.

The natural temperature of the interior of the body is 100° F., while the temperature of the corresponding parts in typhus fever is at least 105° F. This seems at first sight a small increase—only 5 per cent. of the whole ; but it is in reality $2\frac{1}{2}$ times as great as it appears, and actually amounts to $12\frac{1}{2}$ per cent., or *one-eighth* part of the total animal heat. For the total quantity of heat given out by the heated body is proportional (from Newton's law of cooling) to the elevation of its temperature above the temperature of equilibrium, towards which it tends. If we suppose this equilibrium temperature to be 60° F., then the quantities of animal heat given out in typhus fever and in health will be in the proportion of 45 to

40, showing that the animal heat of typhus exceeds that of health by *one-eighth* of its amount.

We have already seen that the work due to animal heat would lift the body through a vertical height of eight miles per day; and it thus appears that an additional amount of work, equivalent to the body lifted through one mile per day, is spent in maintaining its temperature at fever heat.

If you could place your fever patient at the bottom of a mine, twice the depth of the deepest mine in the Duchy of Cornwall, and compel the wretched sufferer to climb its ladders into open air, you would subject him to less torture, from muscular exertion, than that which he undergoes at the hand of Nature, as he lies before you, helpless, tossing, and delirious, on his fever couch.

The treatment of this formidable disease in former times consisted of purging, vomiting, and bleeding the patient, with the view of eliminating an imaginary poison, and so helping nature to terminate the disease.

In modern times, thank God, the physician either does not interfere at all, or adopts the rational process of retarding the disintegration of the tissues consumed to supply the fever heat, by furnishing in their stead fuel, in the form of wine and beef-tea, sufficient to maintain the increase of temperature imperiously required. This practice may be justly considered rational, because the condition of the circulation admits of its application, and it is considered good, because it has been rewarded with success in the hands of the skilful clinical physician. In concluding this sketch of the prominent symptom of typhus fever, and as an illustration of the eagerness with which every possible combustible in the body is made use of, I may mention, on the high authority of Dr. Stokes, of Dublin, that the very urea excreted by the kidneys is not permitted to leave the body without first paying its tax to fever, by being burned into carbonate of ammonia, thus rendering the urine of an advanced case of a bad typhus fever eminently alkaline.

B. *Asiatic Cholera.*—This remarkable disease presents, as every one knows, three distinct stages; viz. :—

1. The premonitory stage of diarrhœa.
2. The stage of collapse.
3. The stage of consecutive fever.

The stage of collapse exhibits the following symptoms :—Vomiting or purging, muscular cramps, suppression of bile and urine, lowering of body temperature to 95° F., extreme prostration of strength, extremities pulseless, and face Hippocratic.

When death occurs during collapse, the following symptoms are usually found on careful examination of the corpse :—The temperature rises to 103° F., the muscles give out their characteristic susurrus CCC, and exhibit spontaneous movements, the whole train of symptoms producing the effect of a ghastly attempt at resurrection.

In this disease we have phenomena respecting animal heat, the very reverse of those found in typhus fever ; the body performing one vertical mile short of its daily work, instead of one mile in excess. The prostration of strength resulting from this deficient combustion is so great, that death is often caused by bringing the patient to hospital in a cab instead of upon a stretcher, by his walking up a dozen steps into his ward, and sometimes even fatal results have followed a sudden effort to sit up in bed to vomit.

The rise of temperature after death, and the continuance of muscular susurrus and motion, tend to prove that the impeded circulation, which is the prominent symptom in cholera collapse, is due to constriction (probably vasomotor nervous) of the capillaries, in consequence of which the muscles are deprived of their supply of freshly oxidised blood, the result of which is necessarily contraction and cramp, which produces the excessive agony that characterises this disease.

All authorities on cholera, whether their object be to "impede" or to "assist" nature, are agreed that medicines, whether astringent or purgative, are not only useless, but dangerous, in the stage of collapse.

It is useless to give alcoholic fuel to restore the loss of animal heat, for there is no circulation to cause the oxidation of the hydrocarbons.

It is equally useless and more dangerous to give opium, to check the remaining purging that exists ; for if vomiting have ceased, your acetate of lead and opium pills lie as if in the stomach of a corpse, and at the termination of collapse your patient enters upon the consecutive fever with perhaps a dozen grains of opium in his stomach, placed there like an explosive shell by your ill-timed zeal, and rapidly passes into a comatose condition, from which he never for a moment rallies. His death is always accredited by the registrar to cholera morbus, and not to opium.

Purgatives and emetics in cholera collapse effect the same object as opium, but with greater rapidity. In the stage of blue collapse the chances of life and death are almost exactly equal, and the slightest additional loss of force turns the wavering beam on the side of death. The effects of a brisk purgative or emetic (if they act) upon a patient unable to climb a dozen steps or sit up for a quarter of an hour without fatal syncope, may be easily imagined ; and the use of them cannot be justified by any arguments borrowed from right reason.

A remarkable though transient improvement takes place in collapse by the injection of warm water (brought to the specific gravity of serum by the addition of mineral salts) into the veins or bowels; the patient loses the cramps, feels that he is about to recover, speaks to his friends, and often transacts whatever business is necessary, but speedily falls back into collapse. The improvement in his condition is altogether due to the temperature of the fluid injected, which supplies for a brief period the deficient animal heat, permits a partial oxidation of the blood, restores the capillary circulation in the muscles, and so destroys their cramp; and by supplying the deficient work required, removes for the moment the fatal prostration of strength. Any one who has witnessed the remarkable effects of warm liquids thus injected in cholera collapse must feel that recovery would be certain if the improvement could by any possibility be made permanent.

Our hopes for the future, as to the treatment of cholera, lie, as I believe, in the direction of supplying to the body directly its lost animal heat. I have witnessed the happiest results from an injection of warm salt water into the bowels, assisted by hand friction of the surface with turpentine and chloroform, and the application of bags of hot salt along the spine; in cases treated in this manner we may expect to witness cessation of muscular cramp, restoration of perspiration to the skin, with increase of capillary circulation, and finally, to reward our efforts, a return of the excretions of urine and bile; when these reappear, all vomiting and purging cease, and our patient is almost cured.

After recovery, the contrast between the cholera and fever patient is as great as it was during sickness. The fever patient has been overworked for nine or fifteen days without a suitable supply of food, and, when convalescent, experiences a complete exhaustion of strength that lasts for many weeks. The cholera patient, on the other hand, has been prevented from working by constriction of the capillary vessels, caused by the absorption of the cholera poison, and feels, on recovery, much like a man that has been half drowned, while the fever patient resembles a man that has been half starved; the one is able to return to his work in the course of a few days, the other only after the lapse of as many weeks.

C. *Diabetes mellitus.*—This disease furnishes us with one of our best proofs that all the chemical changes, by means of which work is produced, take place in the blood and not in the tissues of the body; and, at the same time, an examination of its phenomena explains satisfactorily the regimen and diet which has been found, by experience, most suitable to the diabetic patient. I shall illustrate the disease by a case which was placed under my control, by Dr. Stokes, some years ago.

A young man, aged 20, named Murphy, suffered from fever (enteric ?) in November, 1859, and, on recovering, became diabetic; he was admitted into the Meath Hospital in October, 1860, where he remained, under my observation, until his death on January 12, 1861.

He was allowed for nine weeks to eat as much as he liked of certain kinds of food, which were varied, week by week, to suit his wants, my object being to obtain, if possible, the natural constants of the disease undisturbed by external interference; the only medicine used by Dr. Stokes's order being opium, to produce sleep, and a little creasote occasionally to promote digestion. As the details of this experiment have been fully published, I shall confine myself to the final results. His food and excretions were analysed from week to week, so as to determine the total quantities of sugar-forming and urea-producing food, as well as the sugar and urea actually excreted.

During six of the nine weeks the sugar excreted was in excess of the sugar ingested, and the mean of the daily excretion and ingestion of sugar were :—

Sugar excreted	9773 grs.
Sugar ingested	9321 ,,
Diff.	452 ,,

During two of the nine weeks of observation the urea excreted was in excess of the urea ingested, and the mean daily excretion and ingestion of urea were :—

Urea excreted	1182 grs.
Urea ingested	1349 ,,

The foregoing facts illustrate strikingly one of the prominent symptoms of diabetes—viz., the canine appetite—the quantity both of sugar-producing and urea-forming food consumed is more than double what is necessary to maintain a vigorous labourer in perfect health. An examination of the excretions explains the other prominent symptom of diabetes—viz., the complete prostration of strength in the patient, notwithstanding the great amount of food consumed.

In a state of health, food produces three excretions only—viz., urea, carbonic acid, and water; in diabetes the farinaceous foods appear in the excretions as sugar, and not as carbonic acid and water; and the work necessary to maintain animal heat must be provided altogether at the expense of flesh food, which is the very form of food least fitted to maintain it.

The diabetic patient resembles a racing steamboat on the Mississippi whose supply of coal is exhausted, and whose cargo furnishes nothing better than lean pork hams to throw into the furnace to maintain the race. It cannot be wondered at that our poor patient, under such disadvantageous conditions, fails to keep in the front.—*Med. Times and Gazette, August* 22, 1868, *p*. 203.

4.—FACTS CONNECTED WITH THE DURATION AND DIAGNOSIS OF RHEUMATISM.

By Dr. S. O. Habershon, Physician to Guy's Hospital.

What is rheumatism? and what is the value of its statistics?

From the variabilities in our English climate, rheumatism is a disease of most frequent occurrence, and not only do instances continually arise in ordinary practice, but it is almost the exception to find any person who has arrived at years of maturity who has not at one period or other suffered from rheumatic pain. Still, it is beyond the reach of our present knowledge to say precisely what rheumatism is, or to indicate the changes which take place in the organic chemistry of the system during its attack. Some affirm that peculiar metamorphoses induce a disordered condition of the fibroid tissues of the body, and that in some persons these changes are more easily excited than in others, constituting a "rheumatic diathesis." Others advance a step further and assert, that the production of lactic acid by perverted nutritive changes constitutes the proximate cause of rheumatism. Dr. Prout suggested that this acid was the origin of the rheumatic symptoms, and Mr. Simon and Dr. Richardson have demonstrated that if introduced into the system, as by injection, it will produce symptoms of cardiac inflammation resembling rheumatic endo- and peri-carditis; and the presence of acid perspiration, the excess of euric and sulphuric acids in the urine, have seemed to favour such an hypothesis. But *one* symptom does not constitute rheumatism, for there is in this malady a disturbance of the whole organism, and not only the blood, and fibrous tissues, but the entire *nervous* system is involved in the morbid process.

It is not surprising that there is a remarkable difference in the severity and in the duration of rheumatism; and, in many instances, these peculiarities may be explained by constitutional complications. Both inherited and acquired morbid tendency thus greatly modify the course of rheumatic disease; one malady does not preclude the existence of another; these associations are often overlooked, they render an uniformity in treatment almost impossible, and they greatly *diminish the value of statistical returns.*

Some of these complications may be briefly dwelt upon, and they are of undoubted importance in everyday practice.

1. Rheumatism occurring in strumous subjects.
2. Rheumatism after syphilis, without ordinary periostitis.
3. Rheumatism with, or directly after, gonorrhœa.
4. Rheumatism in persons of intemperate habits.
5. Rheumatism in advanced life.
6. Rheumatism with miasmatic poisoning.
7. Rheumatism accompanying zymotic disease.

1. The occurrence of rheumatism with struma is by no means an unusual event. It is not only found amongst the poor, but even amongst those who are enabled to use every means of protection from exposure to cold, and from the inclemency of the weather. I might adduce many instances which have come under my care in the wards of Guy's Hospital. In some of these delicate patients, there is a greater tendency to persistent effusion into the joints; and in some patients organic disease of the larger joints is preceded by a true rhueumatic attack; such cases are happily, however, rare. A short time since, a young man, on admission under my care at Guy's, was found to have effusion and commencing caries of the knee joint, and it was considered as of a rheumatic character, for several other joints had been affected in a transient manner at the commencement of acute symptoms. Again, it has appeared to me that rheumatic effusions into the pleura are most difficult of absorption in strumous subjects; and it is probable that acute cardiac affections run a more rapid course.

In directing the treatment of rheumatism, a strumous diathesis should receive special consideration. Violent measures are badly tolerated, and the convalescence is thereby greatly retarded, even if irreparable mischief is not induced. Strumous subjects are most unfavourable for any depletory measures; and we cannot too strongly express our sentiments in reference to the free use of mercurial medicines. We have seen acute pericarditis come on during salivation, followed by great irritability of the heart; and the convalescence of patients affected with rheumatism, who have been treated with mercurial medicines so as to affect the system, is, we believe, slow and tedious.

Another fact well worthy of consideration, in reference to the effect produced by preparations of mercury, is that, when the valves of the heart have been thickened and contracted from old rheumatic disease, the relief arising from the increased activity of the abdominal glands by this medicine is often very marked; but, unless it be speedily withheld, the muscular fibre of the heart becomes enfeebled, and thereby dilatation is increased; and in some instances we have witnessed ulceration in an old damaged valve, which was possibly due to the same cause.

A favourite plan of treatment with some practitioners is the very free use of alkalies in acute rheumatism; but neither is this plan free from injurious effect, especially in strumous subjects. There are three conditions that we have thought attributable to, or, at least, greatly promoted by, this excessive administration of alkalies: 1, great anæmia; 2, excessive irritability of brain; and 3, irregular choreal movements. The alkalies, doubtless, enter the blood, and that perhaps more readily than any other medicine; and, when given in immoderate quantity, they change the blood constituents in a manifest degree. The second condition of functional irritability of the brain is, perhaps, due to a similar cause. We are well aware that all these states may be quite independent of these remedies; but we believe that these conditions may arise from the improper use of remedial agents.

We do not mean to affirm that alkalies, when given so as to produce more free action of the kidneys and other glands, are not of service, nor that a free mercurial purgative is not also beneficial; but to administer ounce after ounce of alkaline remedy to neutralise so much lithic acid or lactic acid, because the perspiration and the urine are unusually acid, is certainly neither physiological, nor is its good result borne out by clinical experience.

Strumous subjects with rheumatism soon bear the preparations of steel with advantage, as the iodide of iron, the potash tartrate, &c.; and in some, especially chronic cases, cod-liver oil is of great value.

2. Periosteal disease is a common sequence of syphilis; and not only does the true periosteum become affected, but other fibroid tissues are implicated; pain is produced, and the patient is said to have rheumatism; but, besides this spurious rheumatism, persons who have been poisoned by syphilis are often the subjects of true rheumatic disease of the joints; the joints become red, swollen, and painful, and the malady presents all the characters of the simple ailment. We have, however, found that it subsides less easily, and is very apt to return on the slightest exposure to cold and wet.

In the treatment, alkalies are often of great value, especially the iodide of potassium; and, where there is diminished power, these alkaline remedies should be combined with quinine or with bark in one or other form.

3. Whilst some altogether deny the existence of gonorrhœal rheumatism, others regard it as a form of pyæmia; gonorrhœa is, unfortunately, so common a disease, that a very many hospital patients are found with it; and in many instances only a short period elapses before the symptoms of rheumatism are developed, or they arise whilst the discharge continues.

What, however, is the relation of the two ailments? Is their occurrence a mere coincidence? or does the pain in the joints arise from a poisoned condition of blood allied to suppurative fever? Instances have occurred in which acute suppurative articular disease of a fatal kind has happened, several joints being involved, for which no cause could be traced, but the gonorrhœa then existent. Still, whilst numerous instances of gonorrhœa occur without any articular affection, or any recognisable disease of the blood, the following instance shows the manner in which the veins sometimes become involved. A patient, some years ago, was admitted under my care into Guy's Hospital for acute pneumonia on the right side. The symptoms were well marked; and, with saline treatment (bicarbonate of potash), he speedily convalesced, and was about to leave the hospital. Fatal symptoms, however, very unexpectedly came on; for, after a good night and partaking of his usual breakfast, even assisting to clear away the breakfast things, he told the nurse that he was faint; he sat down upon the edge of his bed, and in about half an hour he died. The lung was recovering, as we expected, and the pneumonic deposit in it had become nearly absorbed; but we found what had previously not been ascertained, that he had recently suffered from acute gonorrhœa. The veins at the base of the bladder were filled with adherent fibrine, and the iliac veins were in a similar state; and a clot separated from these veins had been carried to the right ventricle, and the action of the heart became so embarrassed as to cause speedy death. Rheumatism associated with gonorrhœa or gleet is, we believe, unusually persistent.

4. In persons of intemperate habits, whose vessels have become diseased and the viscera damaged, we have another cause for longer duration in an attack of rheumatism; but this obstinacy of character is still more manifest where—

5. The malady occurs at a period of life, when the vessels have become degenerated. Senile rheumatism has peculiarities, and one of them is greater persistency.

6. When persons who have resided in miasmatic districts become affected with rheumatism, there is a more marked periodicity in the symptoms: one day the skin being normal, the next clammy and perspiring, with rheumatic pains. We have witnessed, with enlarged spleen, sudden severe eruption on the skin, at first, in red blotches of roseola, and afterwards blebs, resembling rupia escharotica, shewing that there was, at least, peculiar cachexia, modifying the rheumatic affection.

7. Instances have been recorded, in which zymotic diseases, as typhus and typhoid, have been accompanied with rheumatism. I have never witnessed well marked instances of this kind; but there is nothing opposed to the known facts of disease, that an

affection, having its origin in disordered metamorphic changes, should co-exist with one arising from animal poison, as typhus. It must, however, be remembered, that some cases of pyæmia closely resemble typhus fever. A few months ago, a woman was under my care in the hospital for chronic rheumatism. She slowly convalesced, and was about to return home partially relieved. In the next bed was a severe case of typhus, and the rheumatic patient became alarmed, the tongue became dry and brown, the pulse small and very compressible; there were no maculæ, and the temperature was not much increased. It was feared that she might sink from exhaustion; stimulants were given freely; she rallied in a few days, and left the hospital. It was doubtful whether the symptoms arose from nervous alarm, or whether the contagion of typhus had anything to do with the sudden prostration. If, then, there be such complications, and others that might be mentioned, statistics, unless compiled with more than ordinary care, must be exceedingly deceptive and of comparatively little value.

Again, whilst there are many characteristics of true rheumatic disease, few maladies are more easily mistaken, and there is *no* sign which is *uniformly* present. Pain is, perhaps, the most constant indication, with stiffness of one or other joint; but rheumatic pericarditis may, and often does exist, without any pain whatever. The same may be said in reference to febrile symptoms, to increase of temperature, and to changes in the urine; none of these signs are pathognomonic.

Many maladies are designated rheumatic which have no connexion with that disease.

1. *Diseases of the spine* are often said to *commence* with an attack of rheumatism; but it will generally be found that the pain in the course of the nerves or in the fibrous tissues arises from direct implication of the nerves or of their centres.

2. The same remark applies to pain produced by the pressure of *cancerous*, *aneurismal*, or other tumours. Thus cancerous disease of the lumbar glands is often mistaken for lumbago; so also the pain from aneurismal disease of the thoracic and abdominal aorta, when no pulsating tumour can be detected, is referred to rheumatism.

3 During the course of *renal disease*, abnormal irritation arises not only in the serous membranes, producing pericarditis, pleurisy, peritonitis, &c., but a similar change happens with the synovial membranes, and a form of disease is induced which simulates rheumatism.

4. In chronic poisoning by *lead*, vague pains in the fascia, as well as in the joints, have been designated "saturnine arthralgia."

5. We have already referred to *periosteal disease* as a source of fallacy in the diagnosis of rheumatism.

6. *Shingles* or *herpes zoster* may be found in the course both of the cerebral and spinal nerves; and the severe pain which precedes the eruption of the vesicles, and which also follows their disappearance, closely simulates local rheumatism.

7. A more important disease, and one which is attended with fatal issue, is *pyæmia*. It closely resembles rheumatism; for, with rigor and febrile symptoms, there is fixed pain and swelling in the joints—first one, then another, being affected, though without subsidence of those parts first attacked. But, whilst there may be some similarity in the symptoms, the prognosis is widely different. The one is generally a curable disease; the other, a fatal one.

We might also refer to the severe pains in the back which precede some of the exanthems, as small-pox; and to the general *malaise* of fever; but these could scarcely be mistaken for rheumatism. And, lastly, the symptoms described as arising from acute *trichinous disease* have some resemblance to rheumatism in the pain in the limbs. I have never seen an instance of a patient dying in consequence of this affection, although in numerous cases I have witnessed the trichina spiralis in the muscles after death.

It is an excellent rule, whenever there is local pain, to examine for a local cause; but it is often surprising to notice the strange maladies which are designated as rheumatic, at one part or other of their course, from the character of the pain; and, even when the disease is truly rheumatism, we attach but little value to statistics drawn up without reference to individual peculiarity. The natural result of this disregard of constitutional difference is to follow a routine plan in the remedies employed; in fact, treating the disease rather than the patient. We believe that rheumatism may be greatly relieved, or shortened in its course, by the proper use of means; and we strongly deprecate the treating of mere symptoms, as both injurious and unphysiological. But we would urge that each case be estimated in all its relations; and that a patient having severe rheumatism should not be at once dosed with calomel and opium, or with a certain number of drachms of saline medicine, irrespective of every other consideration.—*British Medical Journal, June* 30, 1868, *p.* 603.

5.—THE TREATMENT OF ACUTE RHEUMATISM.

By Dr. N. J. Butler, Blackrock, Dublin.

As I think many practitioners are not aware of the extraordinary efficacy of valerian, administered in the form of a bath, in subduing the pain and inflammation attending acute rheumatism, particularly of the arthritic form, I consider I am merely fulfilling a duty to the profession and public by mentioning it. It was first introduced to my notice by my friend, Dr. Adrien —a name known and honoured in the annals of Dublin surgery —since which time I had opportunities of testing and proving its wonderful power of arresting and cutting short the most violent attacks of acute rheumatic arthritis. The bath is made simply by taking lb. i. of valerian root, boiling it gently for about a quarter of an hour in one gallon of water. Straining and adding the strained liquid to about twenty gallons of water in an ordinary bath. The temp. should be about 98°, and the time of immersion from twenty minutes to half an hour. Pains must be taken to dry the patient perfectly upon getting out of the bath. If the inflammation remain refractory in any of the joints, linseed meal poultices should be made with a strong decoction of valerian root, and applied.—*Medical Press and Circular*, *Aug.* 5, 1868, *p.* 133.

6.—THE REMOVAL OF CANCER BY CAUSTIC ARROWS AND CARBOLIC ACID.

By Dr. J. R. Wolfe, Ophthalmic Surgeon to the Aberdeen Royal Infirmary.

[The favourable termination of the following cases increases the interest attaching to them from the mode of treatment adopted.]

Case 1.—*Epithelial Cancer.*—J. B., aged 51, farm servant, applied for advice at the Royal Infirmary, Aberdeen, in May, 1867, on account of a tumour in the inner canthus of the left eye. The tumour was about the size of a large walnut, rounded in form, hard, inelastic, and nodulated to the touch, immoveable, being firmly attached to, and involving part of both eyelids, affected every now and then with attacks of lancinating pain. He stated that it began about nine years ago, in the form of a small wart at the inner angle; it remained nearly stationary for a considerable time, but some months ago it had begun to enlarge, and continued to progress rapidly.

On being told that it was malignant, and would require an operation for its removal, he left the hospital, and did not again present himself till July 3rd, at which time the tumour had begun to break up on the surface by ulceration; being covered with a crust, and having an ichorous discharge, of a slightly offensive smell, spreading and infiltrating the subintegumental tissue. Examined with the microscope, it presented the ordinary characters of epithelial cancer. The awkward situation in which it was placed rendering it difficult of removal by the knife, without producing cicatrices which would have given rise to considerable deformity of the eyelids, I had recourse to the following procedure.

Five openings were made with a broad lance, into which caustic arrows were inserted ; one of these was in the centre of the tumour ; the other four were in the healthy skin round its margin ; and the neighbouring parts were protected by a patch of leather, having an opening cut in its centre of sufficient size to embrace the tumour. The whole was covered with a compress of dry lint and bandage. As the patient complained of no pain, nor any irritation, he was allowed to move about the ward as usual.

On the third day, the whole tumour came away, leaving a grey-coloured slough, which was detached in the course of twenty-four hours by the use of linseed-meal poultices. The surface now exposed was clean, and presented irregular elevations, which bled very readily. The gap left was so deep as to expose freely the inner wall of the orbit as far back as the middle of the eyeball. The surface was now painted with strong carbolic acid, and the whole covered by wadding dipped in glycerine. This treatment was continued for three days ; by which time the bleeding elevations had disappeared, and the whole presented an uniform granulating surface. It was then covered with carbolised wadding dipped in glycerine ; the dressing being changed every second day, and the wound washed with a weak solution of carbolic acid. Under this treatment, the gap filled up rapidly ; and in a fortnight it was entirely healed.

In August, I exhibited the case at the meeting of the North of Scotland Medical Association ; when the skin about the inner canthus and eyelids presented its natural appearance, and scarcely a trace of cicatrix remained to show that loss of substance of such an extent had occurred.

I had an opportunity, quite recently, of examining the patient, and found the cure complete. The only traces (and these only to be observed on minute inspection) are : a slight elevation at the inner angle, as if the periosteum there were thickened, and the obliteration of the tear-duct, which, however, does not give rise to any inconvenience.

Case 2.—Cancerous Cyst.—E. A., aged 68, domestic servant, was admitted into the Royal Infirmary, October 12th, affected with a hard tumour of the left inner side of the lower eyelid and cheek, measuring two inches and one-eighth in its largest diameter ; of an oval shape, irregular and nodulated on the surface, and presenting the appearance of small abnormal vessels ramifying on its cutaneous surface, which was completely adhering. On puncturing it, there escaped a quantity of bloody serum and air-globules, which evacuation, however, did not diminish the size and hardness of the tumour. This fluid, when examined under the microscope, presented a mixture of cells and granules, but of so undecided a character as not to make it clear whether these were cancerous, or merely the products of an inflamed cyst; but the bulk of the tumour, &c., showed unmistakeable characters of malignancy. The tumour was removed by caustic arrows, as in the last case, and dressed with carbolic acid. The patient was discharged in eighteen days, scarcely any appreciable cicatrix being left, and still continues well.

Remarks.—The advantages of this mode of treatment appear, as far as two cases prove anything, to be the following.

1. It is painless. Patients walked about the wards as if nothing had been done, and complained of no feeling of pain or discomfort whatever.

2. The tumour is completely eradicated; and, under the action of the antiseptic, which acts in the first instance as a caustic to the diseased tissue, healthy granulations are produced, which completely fill the gap, and leave little or no trace of a cicatrix.

This method appears exceedingly valuable for removing tumours from regions where no skin can be obtained from the neighbourhood; and is also applicable to erectile tumours, nævi, cancer of the breast, &c., occurring in patients, places, or seasons of the year, when the use of the knife is to be dreaded.

On my mentioning the result of my cases to Professor Gosselin, he told me that for the last few years he had rarely used the knife for the removal of cancer of the breast in the Hôpital la Pitié, but regularly resorts to the use of caustic arrows. The result is, that he does not now meet with cases of erysipelas, which used to be very common in his wards. He showed me several cases under treatment; but they were not sufficiently far advanced to enable me to judge of the appearance of the cicatrices, or to decide how much of the beautiful result above detailed is due to the carbolic acid and how much to the arrows; in short, to determine whether the same result might not be obtained by the use of the knife and carbolic acid.

The arrows employed I obtained from the Pharmacien of Hôtel-Dieu, Paris, who prepares them by dissolving chloride of zinc in a little water, making a saturated solution, and mixing it with sufficient starch to make a stiff paste, which is rolled into a thin cake, cut into shape, and dried at 212° Fahr. Although elsewhere I have claimed priority in the use in this country of carbolic acid as a dressing for wounds, yet I by no means wish to undervalue the great service rendered by Professor Lister to surgery in the systematic employment of it. Having seen its employment in Professor Lister's wards in the Glasgow Infirmary, I may be allowed to bear testimony to the skill, care, and originality, with which his experiments have been carried out.—*British Medical Journal, Sept.* 19, 1868, *p.* 303.

7.—A READY MEANS OF APPLYING CHLORIDE OF ZINC IN CANCER.

Mr. WEEDEN COOKE sends us an account of a process he has devised for this purpose, and which he finds most useful. Following a plan adopted in some hospitals, of steeping lint in solution of sulphate of copper and liq. ferr. perchlor., and afterwards drying it, he has been substituting chloride of zinc for these substances, and finds this preparation most convenient for application. "The chloride of zinc, being a highly deliquescent salt, requires scarcely more than exposure to the air to render it liquid; at least a very few drops of water will quickly produce this effect. The lint is thoroughly soaked with this liquid, and hung up for a short time. It does not dry so completely as the iron or blue lint, owing to the deliquescence of the zinc. It preserves its active properties for weeks, if kept in a wooden or pasteboard box, such as a seidlitz powder box. An old pair of scissors should be kept for cutting it, and forceps coated with vulcanite may be employed in its application or removal. The great convenience of the chloride of zinc lint is that the smallest pieces may be used, even to a wart or pimple, or to parts such as the eyelids, to which it would be almost impossible to apply the old paste. There is also the advantage of confining the caustic effect absolutely to the part to be attacked. I have used it to those stubborn indurated ulcers at the inner canthus, be they lupus, rodent ulcer, rodent cancer, or what not, as well as the upper and lower lip, and other parts of the face, with the greatest advantage; and have obtained better results than formerly, because of the power of adapting the application exactly to the size of the eschar required, and the ease of keeping the lint on as long as need be, and re-applying it as often as may be necessary, with very little discomfort to the patient. It being always ready, the surgeon in going round his wards may himself apply this lint to a commencing slough, either in a cancerous breast, or an ulcerated leg, or a bed-sore, or a phagedæna, and at once check that which otherwise may give much trouble to stay. I had occasion to enucleate a large epithelioma, from the parts about the umbilicus, which dipped down so deeply as to render it probable that it had reached the inner wall of the abdomen. An eminent surgeon advised removal by the knife, but the patient objected, and I set to work with some trepidation to remove it by the means of the chloride of zinc. There being a large surface to destroy, I used at first the paste, taking away every other day the dead portions; some little bleeding occurred when these were removed, but by means of the iron lint it was readily checked. It was not possible by any amount of packing round the diseased part to prevent very troublesome excoriation of the healthy parts, and so, at the latter part of the treatment, it occurred to me to use the lint as I have above described. It answered perfectly, and the whole of the cancerous mass was removed, leaving a red healthy granulating surface, which soon healed by the application of resin cerate. In a very curious case, which seemed to combine the appearances of keloid and encephaloma, I have recently been able to discharge from the hospital to resume her usual occupation, after a twelve months' residence there, a patient upon whom I had twice operated by means of the écraseur for large growths of a soft spongy character, having an extended horny base. These soft excrescences reappeared, and I finally attacked them with the zinc lint so successfully, that for a time at least there seems a prospect of immunity. For uterine purposes also, this convenient method of using chloride of zinc is much to be commended. Passed up through the speculum to the diseased part, and covered by a further plug of dry lint, it does its work, if properly measured for the part destroyed, without injury to the healthy tissues."—*Practitioner, Sept.* 2, 1868, *p.* 181.

8.—RELIEF OF PAIN IN OPEN CANCER.

The field for experience in cancer at the Middlesex Hospital is, as well known, an unusually large one, and opportunity has therefore been afforded for testing fairly the action of remedies in affording relief in this distressing disease. We learn that the exquisite pain which belongs to open cancer is found to be best relieved by the stramonium ointment, which is employed at this institution. The following is the formula for this in the hospital pharmacopœia:—Half a pound of fresh stramonium leaves, and two pounds of lard. Mix the bruised leaves with the lard, and expose to a mild heat until the leaves become friable, then strain through lint. The ointment thus prepared is spread upon lint, and the dressing changed three times a day.—*Lancet, August* 8, 1868, *p.* 185.

9.—ON THE TREATMENT OF PYÆMIA.

By C. S. Jeaffreson, Esq., Senior Resident Surgeon to the Royal Free Hospital.

[After relating a case of pyæmia which terminated favourably, the writer observes:]

Many persons would, perhaps, feel inclined to doubt this case being one of pyæmia in its most general sense, from the favourable nature of its result. He was throughout kept well under the influence of alkalies, his excretions being fully alkaline; and with this was combined a full allowance of stimulants and support.

This method of treating cases of septic infection has been ably advocated by Mr. Savory. Whether it acts by neutralising or modifying the poison, or whether, by maintaining the blood in a fluid condition, it tends to prevent that first step of coagulation which, in its secondary effects, plays such an important part in the history of embolism and metastatic abscesses, is a matter of speculation. Of this there can be no doubt: that the alkalies, being readily dissolved, are readily absorbed into the blood, upon which they exert a powerful influence, indirectly stimulating the excretions. This action may be summed up under three heads: 1. Direct antagonism of the poison; 2. Protection against coagulation; 3. Promotion of secretion and excretion. Doubtless the stimulants also play an important part in keeping up the circulation; and thus we may say that the indications to fulfil are, to keep the blood fluid, and to keep it circulating.—*British Medical Journal, August* 29, 1868, *p.* 219.

10.—NOTES ON THE TREATMENT OF CHOLERA.

By Dr. T. M. Lowndes, Bombay Army.

[In some remarks published in the Transactions of the Bombay Medical and Physical Society for 1860, Dr. Lowndes advocated the use of astringents with one or two full doses of opium at the commencement of cases of cholera.]

With respect to the treatment of the first stage, I have, since the time when my remarks were written, omitted entirely the use of astringents, finding that a draught containing fifteen or twenty minims of chloroform, with ten or fifteen minims of tincture of opium, with a drachm of spirit to render the chloroform miscible with water, was exceedingly efficacious. During several years, when cholera was more or less prevalent, I have treated a large number of patients by this method, and can only call to mind one case where the disease progressed to collapse, and two cases where diarrhœa went on to rice-water purging and vomiting. It may be objected to this, that these cases were not choleraic purging; but the vast majority of them occurred during the time when cholera was present, and the symptoms supervened between midnight and five in the morning, with crampy pains in the stomach and bowels. These cases in India are specially suspicious, the patient going to bed quite well, and being awakened at the time named. During the prevalence of severe cholera, the same result was observed. The orders issued were, that every person suffering from diarrhœa was at once to come to the hospital for treatment; and this medicine was administered, with the general result that but few required a second dose.

[The writer then gives two cases illustrating the plan of treatment pursued. Of these we reprint the first.]

Kublee, sepoy, aged about 25, was admitted May 22nd, 1866, at 10 a.m., complaining that he had much pain in the stomach, and saying that he had been purged three or four times during the previous evening, and that vomiting of white fluid had come on in the night. Pulse small and quick; anxious expression of face. He was ordered to have immediately fifteen minims of chloroform, ten minims of tincture of opium, and a drachm of spirit, in an ounce of water; and to have a mustard poultice applied. I was then called by the native doctor, and found that for the time the vomiting had abated; the pulse was very small and quick. He was ordered to have five grains of calomel immediately; and the following drink every hour, or more frequently, in ounce doses.

℞. Potass. chlorat. ʒj; acidi hydrochlorici fort. ♏viij; acidi nitrici dilut. ʒiss; aquæ ℥xxiv. M.

During the next four or five hours, he was purged two or three times, all rice-water evacuations. I saw him again at 3.30 p.m. He was collapsed; the eyes were sunken; the skin cold, but no sweating; the pulse barely perceptible, and that only at intervals. The voice was choleraic. He was ordered to repeat the calomel and chloroform, without the tincture of opium. At four p.m., I gave half an ounce of arrack in water, which was immediately vomited. He was ordered to have an ounce of Liebig's cold soup every half hour; and to continue the chlorate of potass drink. No raw meat could be procured, but a quantity of the soup was made from a freshly killed fowl, and he had the first dose about 5 p.m. At 6, I saw him again. No vomiting nor purging; pulse markedly improved: skin warmer.

The soup was first given in 1860, in consultation with Dr. Ogilvy, then of Her Majesty's 33rd Regiment, whose remark as to its probable action was to the effect it seemed to supply to the blood what was removed by the purging. This, after careful consideration, I still think is the correct explanation. I would not wish to enter into any discussion in these short notes as to the pathology of collapse; but it will be seen I cannot altogether agree with Dr. G. Johnson's argument, able though it be. I think that the cases of sudden collapse, with little vomiting and little or no purging, admit of a different interpretation to what he has assigned.

The soup was made by placing eight or ten ounces of finely minced raw meat in one pint of cold water, to which eight drops of strong muriatic acid had been added, stirring with a bit of stick occasionally for ten minutes, and then straining. The soup will only keep good a few hours; but if a supply of lean meat be kept ready minced, it can be made almost as wanted. Salt should always be added.

Hitherto I have only given the soup when collapse was established: now I should be inclined to give it in any case where diarrhœa is accompanied with a failing pulse, and most assuredly when the characteristic discharges of cholera have come on.

I believe that at first, especially in collapse, the soup should be administered in small, but frequently repeated, doses. I generally give an ounce or two every hour, or sometimes every half hour, alternating it with the chlorate of potass drink. Water, cold or iced, in small quantities.—*Brit. Medical Journal, Aug.* 29, 1868, *p.* 216.

DISEASES OF THE NERVOUS SYSTEM.

11.—ON INFLAMMATION OF THE BRAIN, INCLUDING SOFTENING AND MENINGITIS.

By Dr. Samuel Wilks, Physician to, and Lecturer on the Practice of Medicine at, Guy's Hospital.

[It must be self-evident that inflammation of the brain cannot be treated after the simple manner of inflammation of the lungs; for in so complex an organ as the brain the symptoms must vary immensely with the part affected, as also with the cause.]

As one of the chief results of inflammation is softening, and as this may arise under a variety of circumstances, I think it will be as well to allude to this first. Softening—or *ramollissement*, if you prefer the French term—is used in a very vague manner. Generally, when we say softening is present, we mean a chronic change has taken place in the brain substance, whereby it has became disintegrated, and its function lost. But softening, as a result of inflammation, may be acute, and be developed in a few days. Such a case we ought not to designate by the name of softening, but by that of cerebritis or encephalitis. In all acute inflammations the tissues become soft, but we should not therefore style the disease by one of its effects. We should not, for example, call pneumonia a case of softening of the lung. In the case of the brain, however, we are often compelled to speak of the result as if it were the disease itself, being altogether ignorant of the cause not only during life, but even after death, a doubt even then existing whether the softening be due to inflammation or be the result of a chronic disintegration from a change of nutrition. Then, again, besides these actual and tangible forms of softening, we are using the term in the vaguest possible sense, as applicable to a great variety of symptoms. Thus, when a person becomes a little feeble in his mind, and has some slight paralytic symptoms, we often say the patient has softening of the brain, intending only to express that some impairment has taken place in the cerebral structure, and not necessarily a change like that of softening, which is visible to the naked eye.

There are, no doubt, a large number of changes going on in the living brain whose effects are at once perceptible by some alteration in the working of the machine, expressed by some physical or mental failing, and which in any other organ would not be manifest. A slight structural change, for example, in the liver would not be apparent except perhaps by some general feeling of *malaise*, but in the brain this would at once evince itself. What these changes are, and how associated with distinct symptoms, we have yet to learn. I hear sometimes the remark made that morbid anatomy has taught us enough, and that all we want is some medical philosopher to arise to generalise from our facts and supply us with theories; but I think I am in a position to say that our facts are meagre or scanty, and that we are only in the infancy of the science of cerebral disease.

As regards this softening—this tangible softening, with its evident symptoms—we have been in the habit of expressing the difference between a chronic softening resulting from decay or degeneration and that arising from inflammation, and styling these white and red softening. You are familiar with the terms red softening as denoting inflammatory, and white as meaning a more passive or atrophic change. If, however, red softening does result from inflammation, then it would be more desirable to at once designate it inflammation of the substance of the brain, or cerebritis, or encephalitis; but the reason, as I before said, why we cannot do this is that it is only in exceptional cases that this inflammatory process is evident as an acute and idiopathic process, and thus we are obliged to speak only of the effects. In the majority of cases the softening is chronic and associated with other disorders. If the softening be of a red colour, we call it inflammatory, the redness being due to the greater vascularity. We are influenced also in our decision by the age of the patient, and by the circumstances connected with the illness. In older persons, and especially where the arteries are diseased, as in morbus Brightii, we expect to find rather the white or non-inflammatory softening.

Suppose we make a *post-mortem* examination and find softening, how does it display itself? In some cases, when you make a section through the organ, you see the hemisphere presenting a peculiar appearance in the medullary matter; a certain portion, more or less circumscribed, looks and feels pulpy, resembling somewhat a piece of blanc-mange. As a rule, however, it does not look thus smooth, but is disintegrated, and thus, if a section be made, it shows a broken surface. When you pass the knife through the substance, it sticks to the knife, and if you stir it about you can make it into a pulp or paste. If merely a number of softened spots were present, these would be apparent, when you made the section, by an equivalent number of broken surfaces.

If the softening has proceeded a stage further, then the brain matter may be quite broken up, or be semi-fluid, and a portion of this running off, a depression is left. If a stream of water be allowed to trickle upon it, the brain matter may be washed away, and a distinct hole be left corresponding to the softened part. Sometimes even during life a disintegration and absorption occurs, so that, when you make a section of the hemisphere, you find a large hollow space filled with a fluid like lime-water and the *débris* of brain substance. All these cases where there is actual loss of substance come under the category of cases of white softening. They arise in connexion with diseased vessels and general decay. In the red or inflammatory softening the disintegration is not so great. Besides these two kinds, some authors have spoken of a yellow softening, which they surmise to be of a peculiar kind, and due to a chemical change going on in the fatty acids of the brain. In some of the best-marked cases, however, which I have witnessed, I have considered that the yellowness is due merely to an altered condition of the colouring matter of the blood which has been present in it.

Then again, showing how difficult it is to decide by the mere colour whether the softening is inflammatory or not, if we take the case of acute hydrocephalus or tubercular meningitis, we know that there is an inflammatory exudation into the ventricles, and that the central parts have undergone a remarkable softening; the septum lucidum and fornix and adjacent parts are broken down and diffluent, but they are perfectly white—milky white. So marked is this that those who maintain that a structure must be red to indicate inflammation would say that this central softening of acute hydrocephalus was due to a simple death or atrophy of the part, or had occurred from presence of so much fluid, which had, as it were, melted it down. Of this there is no proof, but, on the contrary, that the change is inflammatory. You no doubt might think that the microscope would positively inform us as to whether a softening was inflammatory or not, but I am sorry to say it does not do much for us in this respect; for when the cerebral structure is broken up, and a number of new products are present, it is extremely difficult to say whether inflammation has anything to do with the process or not. The microscope is extremely useful in proving the fact of softening, because, besides the broken nerve tubules, it displays a quantity of new formations, as granule masses. which, to say the least of them, are morbid. It often happens that we wish to know whether a part of the brain has undergone a morbid softening or not, and by using the microscope and finding these bodies we are sure of the fact.

Softening is most commonly localised, whether it be due to an acute or chronic cause, but occasionally we find large portions of the cerebral structures affected. In cases where there is much disease of the blood-vessels, spots of softened tissue may be found throughout the whole brain, and in the much rarer cases of acute encephalitis, nearly the whole cerebral structure may be found to be undergoing disintegration. In cases of this kind destruction of so large a part of an important organ will of necessity very speedily bring about a fatal issue, but in instances of local inflammation and softening, life may be prolonged for many months, and ulterior changes result; one of the commonest is for the brain tissue to perish until a mere vacuity is left, containing a whitish fluid with remnants of blood-vessels. In some cases this cavity is lined by a smooth and tolerably thick membrane. Should the inflammatory process proceed to the stage of suppuration, then an abscess is formed. This may or may not be contained in a cyst. The latter, under these circumstances, is not merely a thin delicate membrane, but is a thick, firm bag, composed of tough lymph. A very important question, whether idiopathic inflammation of the brain ever ends in suppuration, you have heard discussed on other occasions—whether, indeed, a cerebral abscess does not signify either that the morbid process has been set up in the bones, or that it is pyæmic. The question has a very wide pathological signification, referring as it does to the mode in which the various tissues of the body undergo their own peculiar modification in disease. It was the question which above all was most interesting to me when I reluctantly retired from the office of demonstrator of morbid anatomy; for after an experience of many years I could not but observe that the character of the tissues was as potent in the form which the morbid product assumed, as the supposed vice in the blood or constitution. For instance, it is said that cancer and tubercle are distinct elementary productions which may arise indiscriminately throughout every part of the body. Such is a prevailing idea, but not founded in fact, as I could show you did time and place allow; and, as regards suppuration, the same opinion is held. You are by this time aware that the old doctrine of inflammation and its various stages was taught by the Professors of Surgery, who took, as a type, the inflammation of the skin or cellular tissues, in which the different processes of lymph production—suppuration and gangrene—could be visibly followed. So strongly imbued were all with this doctrine of inflammation that it was denied that some organs could be the subject of it, as, for example, there was no such disorder as gastritis, because lymph was not found on the surface of the stomach, or an abscess in its walls. We are now learning that the morbid changes take place in the cell structures of the organs and tissues, and that each of these undergoes its own necessarily peculiar alterations in disease.—*Medical Times and Gazette, June* 13, 1868, *p.* 627.

12.—ON DISEASE OF THE SPINAL CORD.

By Dr. Samuel Wilks, Physician to, and Lecturer on the Practice of Medicine at, Guy's Hospital.

The true interpretation of pain in spinal disease is one of the most important matters to understand. In the first place it is undoubtedly true that the spinal cord may be diseased throughout its entire thickness without the patient experiencing any pain, and without indeed there being the slightest sign of shrinking when the back is struck. On the other hand, the most intense spinal pains are those which are caused by disease involving the nerves only, as in aneurisms, which corrode the spine and leave the cord itself untouched. Again, it has been found that in those cases of meningitis of the cord where pains in the limbs have been a constant symptom the roots of the nerves have been involved in the process. With these facts before us we have some general rules to guide us in the interpretation of pain, although I could not positively teach you that pain necessarily implied an implication of the roots of the nerve external to the cord. It is highly probable that to a certain extent an implication of the nerve-fibres within the cord may produce the same result, but pain is not a necessary consequence, I am sure. We may note also that the irritation of the nerve roots not only produces pain and excites the centres to corresponding movements, but also causes tonic spasm or rigidity. Thus, when the membranes are affected in common with the roots of the nerves, this rigidity may often be observed. I have seen a man who, having fractured and dislocated his spine in the upper dorsal region, had intense pain and rigidity of the arms, but as soon as the bones were replaced the pain and spasm passed off. In chronic inflammation of the membranes of the cord the surface of the medulla is generally involved, and thus there may be more or less paraplegia; should the disease at one spot have involved the entire thickness of the cord, then sensation is lost, but the excito-motor function in the part below may be more than usually exalted. In our museum is the spinal cord of a man showing great thickness and ossification of the membranes, closely adherent and bound up with the structure of the cord. This man lay quite paralysed, but his spinal centres were in the highest state of tension, so that it was painful to pass by his bed; the merest touch made his whole body quiver, the act of micturition threw him into convulsions, and, I believe, on one occasion a jar against his bed caused him to spring on to the floor. He was in the condition of a tetanised frog.

Let us see how these observations apply to cases before us, as, for instance, the case of the boy who was lately lying in Stephen Ward with disease of the dorsal vertebræ. His back projected outwards in consequence of an angular curvature, and thus, no doubt, a quantity of inflammatory or purulent material existed within the canal pressing on the medulla; and what might you think would be the result? You would suspect that he would be lying in bed with his legs stretched out, and quite paralysed as regards motion. The pressure not having reached the centre of the cord, you might think that sensation remained; also, as a pressure of this kind on the upper part of the spinal cord would involve the motor tract but leave the sensory entire, and as the medulla would be healthy below, that the true excito-motory function would remain. Thus you would expect that, although he would be perfectly helpless to move in the slightest degree, a tickling of the feet would cause a drawing up of the legs and their flexion on the body. You might also have expected from the membranes being involved, and consequently the existence of an irritation of the cord through the roots of the nerves, that there would have been some convulsive movements of the legs or rigidity. Now all these symptoms were actually present, and considering what, in all probability, was the nature of the case, you will see how they accord with all well-observed physiological and pathological facts.

Thus far, I think, is pretty clear; in some cases of spine disease we may find motion lost only, in others sensation only, or the two together. Then again, although the conducting power of the cord is lost, and with it a paralysis of sensation and motion, its true function may remain, for the former may be destroyed by the most limited layer of disease, supposing it involve the whole thickness of the organ, but let the cord itself below be destroyed, and then the excito-motor has also vanished. But is this all? Has the spinal cord, or the nerves proceeding from it, any other functions? It is thought by many that they have, and thus it is necessary to suppose that a nerve is a vastly more compound organ than was once supposed —that it contains filaments destined for special functions. It has been thought that the fibres which conduct impressions to the spine and those which reflect movements back again are different from the fibres which convey sensations to the brain and from those which carry down the dictates to the muscles. Of this division, however, there is no proof. Then, again, as I shall have presently to show you, there are some who think the muscles have their own sensory nerves, and that we are endowed with a true muscular sense. Again comes the important question, and one of the most vexed questions in nervous physiology and pathology, whether any influence is conveyed along the cord which involves the nutrition of the tissues, or whether the power which the nerves possess in this respect is derived from the sympathetic system.

But this is not all, for it is said that what we call common sensation may be divided into different varieties. I have not Brown-Séquard's lectures at hand, but I think I am right in saying that this physiologist states that there is one sense for touch, and another for the appreciation of temperature, another for such a sensation as would result from pinching or pain, and another for tickling. I could say from my own observation that I have seen a patient who was insensible as regards touch, yet appreciate a difference of temperature. Also it may be constantly observed that hysterical women, who make no complaint of inability to feel any object, yet will often allow needles to be thrust into them with impunity, and sometimes even have lost all power of judging of temperature. I believe Dr. Darwin many years ago separated sensations of heat and cold from those of touch and pain. In mentioning the name of the first distinguished physiologist, I might inform you that it is his opinion that every function of the nerves which appears distinct must have its appropriate filament, and thus he considers that every ordinary nerve contains fibres of eleven different kinds.

There are, first, the fibres which conduct sensory impressions, and then the conductors of motor influence. These are of two kinds—those which pass to and from the sensorium, and those which are connected with the spinal cord for the reflex or excito-motor actions. Then again there are filaments which regulate the calibre of the vessels and their corresponding afferent nerves. If, now, we suppose there is a nerve which conveys to the sensorium the state of the muscle, and if the ordinary sensory nerve is composed of four different filaments, according to the several varieties of sensation already mentioned, we shall have described ten different kinds of fibres. I am not quite sure about the eleventh, but I think it is said that if any branches of a nerve supply a gland it is supposed that a specially appropriate filament is required for the secreting office.

These distinct filaments have never yet been demonstrated in every nerve, and there are some who think that there is no need for the supposition of their existence ; that, for example, the excito-motor function of the spine is worked through the ordinary motor and sensory nerves ; also that the spinal nerves may be influenced through their junction with the sympathetic without supposing that the latter sends distinct fibres to accompany them ; and again, that the different varieties of sensation may be only different forms of impression conveyed through the same nerve.

The question of the compound function of nerves is of especial interest in reference to the question of their influence over nutrition. That such an influence does exist there can be no doubt, and the usual explanation is that the nerves have a controlling influence over the blood-vessels, but what exactly is the nature of these nerves and what their origin has not yet been quite ascertained. There are some physiologists and pathologists who see in chemical action all that is sufficient for the production of the changes in the tissues, whilst there are others who are content to speak of cell-growth altogether uninfluenced by nervous forces, and they enforce their statements by illustrations from the growth of plants and some lower animals, to say nothing of the growth of the human embryo itself. Admitting, they say, that nerve force may regulate or control nutrition, the latter must necessarily be independent of it in its actual operation. Those, on the other hand, who see a direct influence which almost amounts to a vital one propagated by a nerve, would illustrate the fact by cases where a nerve has been severed, and an atrophy of the parts below has resulted ; or a nerve proceeding to a muscle has been injured, and the muscle has wasted. Also as showing the influence of the nerves on nutrition, there are the cases mentioned by Mr. Hilton, where an angry ulcer has healed on the division of the nerve leading to it, or where an ulcer on the face remained open until a neighbouring decayed tooth was removed. The herpetic eruption following a neuralgia would also seem to imply that the condition of the nerve and that of the tissues in the skin were inseperably connected. Dr. Addison had a notion that the chronic ulcer sometimes met with in young girls was due to nervous irritation and intimately associated with the palpitation of the heart, pain in the side, and other neuralgic symptoms so commonly met with in these patients.

In regarding the question of nutrition, we ought, if possible, to look at it in its integrity, and not, because the bent of our mind is towards one branch of science rather than another, make it either a subject of chemistry or one of physics; for we must be quite sure that the cells, the blood, and the nerves are all working in harmony, to say nothing of the lymphatics, which appear of late years to be left quite out of the question in discussing the various processes of nutrition. One great difficulty in judging of the effects of nerve-influence on nutrition has been due to the varying results of paralysis on the tissues; but this might be used as the strongest argument in favour of the compound character of a nerve, and that just as in one case the vaso-motor filaments are involved in disease, in another they might escape. If, for example, an ordinary compound nerve is divided, the totality of its functions is lost; but should that nerve contain filaments possessing different properties, and which, on reaching the spine, take their own respective destinations, it is clear that disease in different portions of the cerebro-spinal centres may involve only certain portions of the nerves, and thus the various forms of paralysis may be as numerous as there are distinct filaments and functions of the nerves. If, for example, there is loss of motion without sensation, it is evident that the nerve is only partially paralysed, and if in one case nutrition is affected and not in another, we should suspect that a certain function of the nerve remained in the one case and was absent in the other. Now, it would be highly desirable to ascertain for certain where the vaso-motor filaments have their source, or, if there be not such in ordinary nerves, at what point of the nervous system the motor filaments receive their influence from the sympathetic. Certainly in central cerebral disease, there may be loss of sensation and motion, but nutrition is unimpaired; also in many cases of spinal disease, we observe the same, whereas there are other cases of disease of the cord where wasting of the muscles is most marked. Thus in the disease known as progressive muscular atrophy, the prime cause of the malady has been usually placed in the tissues themselves, because ordinary paralysis was not known to cause wasting of the muscle; but in answer to this, it may be said that some special part of the cord may be affected, and this will probably turn out to be the case. Waller's experiments, however, tend to show that the nutritive nerves do not altogether proceed from the spine, for if the roots of the spinal nerves be divided, the motor branch wastes away, whilst the posterior retains its integrity beyond the ganglion.

In illustrating this subject I would not attach too much importance to many examples which are constantly mentioned in proof of the importance of nervous influence on nutrition, for many of these would bear a different interpretation. Thus, there is the well-known case of the bedsore which so commonly accompanies paraplegia, and which might be used to exemplify the principle ; but, on the other hand, it might be said that the inability to move for several days, and thus to relieve the pressure from a particular spot, would be sufficient for the effect, as shown by the restlessness which all people in health experience. The strongest argument in favour of such proposition is that if the patient be placed on his side the most extensive ulcer will often rapidly heal. The same remarks apply to the cystitis which occurs also in the disease. This might be referred to the removal of nerve influence ; but, on the other hand, it may be said that the retention of urine causes decomposition, and if the bladder be continually washed the inflammation is prevented. As regards the oft-quoted case of ulcer of the cornea on division or disease of the fifth nerve, it is certain (as I have seen) that the ulcer will heal when the eyelid is closed, and thus all irritant substances prevented from affecting the anæsthetic surface.

The physiological connexion between the spinal nerves and the sympathetic has not yet been fully shown, for in many of the results obtained by passing galvanic currents through the body, it has not yet been ascertained what amount of result has been due to stimulation of the motor nerves or the sympathetic. Thus, in the interesting observations by Remak on what he calls *diplegic* contraction, the *rationale* of it is not very evident. He took a case of progressive muscular atrophy and applied one electrode beneath the right ear and the negative electrode outside the sixth dorsal vertebra, and then on closing the current a contraction took place in the left hand. Faradisation appears to produce the same results, and which are thought to be induced by stimulation of the superior cervical ganglion.—*Med. Times and Gazette, Oct.* 10, 1868, *p.* 411.

13.—ON PARALYSIS WITH WASTING OF MUSCLES, ESPECIALLY IN CHILDREN.

By Dr. J. Russell Reynolds, Physician to University College Hospital.

The causes of infantile paralysis are numerous, and some of them are well understood, inasmuch as they differ in no special manner from those which are encountered in after-life ; but there are some forms of paralysis, of which young children furnish the examples, that we cannot refer to the commonly recognised conditions of hemorrhage, softening, tubercle, syphilis, and the like.

[From the fact that nothing beyond the paralysis has been observed these cases have been sometimes called "Essential Paralysis." The following cases illustrate the disease.]

1. *Commencement of symptoms.*—A. B., a healthy girl, the youngest of three, born of healthy parents, without any premonition of disease of any kind, at the age of nine months "took cold in the head," was feverish, and heavy in manner, for nearly a week, but improved towards the end of that time, and tried to get up. It was seen, however, that she "could not put either foot to the ground," although both of the hands were moved quite freely, and there was no pain nor spasm in the lower extremities. In a very short time she moved and used the left leg as freely and firmly as before the attack of "cold," but the right leg was paralysed, and in the course of a few weeks was observed to be cooler, softer, and smaller than the other.

C. D., a fine boy, the fifth of six healthy children, at the age of four years suffered from some "stomach complaint," was "poorly" for about a week, complained of his legs being "sore," and was found, after keeping his bed for five or six days, unable to stand. At the end of a month he could walk, but, in doing so, dragged his left leg, which was then thinner, softer, and cooler than the right.

E. F., a boy who had "never had a day's illness," the youngest of eleven healthy children, when two years old became fretful, restless, sore all over, and lay on his back ; "seemed to lose the use of all his limbs," and could not sit up ; was distinctly feverish for a day, but for one day only ; he moaned at night ; but after a few days he seemed well. At the end of a fortnight he walked, but did so like a much younger child, and it was noticed that he made no use of his right arm—that the arm was thin, and especially so about the shoulder.

These three cases are sufficient to illustrate the ordinary manner in which the paralysis I am describing makes its appearance. The *febrile* symptoms were slight, and only of short duration ; the constitution was good ; there was no recognised cause of disturbance—no fall, no blow, no exposure to cold, no obvious external influence nor internal derangement which could account for the phenomena. The age at the onset of symptoms ranged from nine months to four years, and dentition did not appear to have exercised any influence in the production of the malady. In some cases, that have come under my notice after several years' duration, it has been affirmed that there were no febrile symptoms at the commencement, but that the child was suddenly, or accidentally, found to be unable to move any of its limbs, or even to sit up; but it must be remembered that slight accessions of fever are sometimes disregarded at the time, and are wholly forgotten afterwards. The child is put to bed because it is not well, and when it is "better" the paralysis is recognised. Laborde (in an excellent treatise entitled "De la Paralysie dite essentielle de l'Enfance") states that fever was present in four out of five cases that came under his observation; and where I have been able to learn accurately the previous history there has invariaby been some period of distinct but slight and transient illness. I therefore beg you to remember this febrile mode of onset; the fever being of only one or two days' duration, being feebly marked, but continues in type so long as it lasts, and unaccompanied by the vomiting and marked nervous disturbances which, under other circumstances, so frequently characterise its presence in early life.

Sometimes, but not more frequently than once in five cases (Laborde), *convulsions* mark the onset of infantile paralysis; and there is occasionally nothing in their actual phenomena which will enable you to distinguish between them and the fits which may arise from dentition, from worms, and from organic disease of the brain. But usually there is an absence of those symptoms which pertain to organic diseases of the brain: there is no vomiting, no headache, no strabismus, and no spasm of the face. Commonly, the limbs are found rigid after the fit has passed away; sometimes there is but one fit, but more frequently there are two, three, or four. When convulsions are present there is no fever, and *vice versâ*, when febrile symptoms constitute the commencement of the malady there are no convulsions.

2. *General paralytic symptoms.*—When first observed the paralysis is usually at its maximum, both of intensity and extent. It is often general—not only the muscles of all the limbs, but even those of the trunk are affected; the child can neither stand nor sit up, nor use its arms. The lower limbs are more distinctly and more frequently affected than the upper, and it is very rare to find paralysis of the sphincters. Paraplegia is the most common form observed at an earlier period, and this form of paralysis may become persistent; but more frequently the "clearing up," if I may use the expression, of the paralytic state extends beyond the arms, and in a very short time—viz., from three to fifteen days, only one extremity remains affected. One of the lower limbs is more often paralysed than one of the upper; sometimes the right arm and the left leg are weakened; sometimes, but very rarely, there is hemiplegia.

The electric irritability of the muscles is distinctly diminished at the onset, and coolness and wasting of the limbs set in almost immediately.

There is no constant change in the sensibility of the skin, or of the organs of special sense ; but reflex movements are sometimes, although not always, abolished in the affected limb.

Paralysis of the kind now described I have occasionally seen in the condition of *pregnancy*, having its onset in a precisely similar manner—*i e.*, appearing as general palsy after two or three days of slight febrile disturbance, and then becoming localised in one limb. Apart, however, from pregnancy—which condition bears some strong resemblance in regard of pathological tendency to the state of infancy,—I do not know of any disease in the adult which exhibits the clinical history now detailed. Ordinary wasting palsy, which is unfortunately but too well known, differs widely in its mode of onset, and in the distribution of its symptoms.

3. *Stage of limited paralysis.*—The paralysed limb *wastes*, it fails to grow at the same rate as the healthy limb, and thus it often remains withered, smaller, and shorter than its fellow. But long before any difference can be detected in length, or even bulk, there is distinct coolness, flabbiness, and softness. The rapidity with which wasting occurs is remarkable ; in the course of a few weeks it is appreciable not only by the hand and the eye, but by the measuring tape. In this disease, as in all others which affect the size of limbs, there is often an amount of malnutrition, that may be quite obvious to the sight and to the touch, which measurements fail to represent ; and surprise is frequently felt when a disparity, very obvious to the eye, is recorded in small fractions of an inch. But in the wasting paralysis of children the amount of inequality is often very great, and may be recognised, at once and to the full, by measurement. Thus in C. D., the calf of the right leg was $10\frac{1}{4}$ in. in circumference, that of the left only 8 in. ; and here there was no shortening of the limb. That the failure of nutrition was mainly in the muscles was indicated by the fact that the right ankle was $7\frac{1}{2}$ in. in circumference, the left $7\frac{1}{4}$ in. Where the muscles were involved the diminution on the paralysed side was $\frac{1}{5}$ of the circumference ; where the muscles were not included the difference was only $\frac{1}{28}$ of the circumference. In the same case there was obvious wasting in the left gluteal region, but it is impossible for me to tell you how much wasting there was in this unmeasurable locality. A similar difficulty prevents me from telling you exactly how great was the wasting in E. F., for here the malnutrition was most obvious in the deltoid muscle, in the pectoralis major, the supra-spinatus, and infra-spinatus scapulæ. It is so evident, however,

to the eye that no other measurement is needed to tell you that it is very great. The head of the humerus may be seen and felt almost as distinctly as if it were removed altogether from the soft parts ; for the bone appears and feels as if covered only by the thin and flexible skin of childhood. Again, in G. H., whom you have seen recently in Ward 3, and whose early history was similar to those I have described, it was impossible to represent fairly in figures the amount of wasting, for both lower extremities were affected, and that to about an equal degree. The girl was generally thin, but the malnutrition of the legs, as compared with the arms, was most obvious to all who saw her.

Sometimes particular muscles, or groups of muscles, are especially affected ; thus, in the upper limb the muscles around the shoulder, and in the lower extremity the extensor muscles lying outside the tibia. Of the former, E. F. afforded an excellent example ; of the latter you have seen several illustrations, observing sometimes that instead of the natural roundness there was distinct hollowing external to the tibia.

The *degree of paralysis* varies from slight weakness to absolute immobility. If the leg be affected a child may simply "drag its foot" in walking, or it may be unable to do anything but crawl upon the floor. When G. H., who is now quite well, came into the hospital she could not stand. for in her the affection was paraplegic, and the wasting and weakness of the glutei were carried to an extreme degree.

The *electric contractility* of muscles is peculiar and interesting. In some cases it is entirely lost, but in others it is only diminished, exhibiting, except in the fact of diminution, its ordinary characters. But what is very remarkable is the following fact, that in certain medium cases, where the loss of voluntary power may be complete, but the failure of nutrition by no means extreme, the muscles respond at once to the application of an interrupted battery current of low intensity, and at the same time exhibit no action when an induced current of high power is directed upon them. This has now been observed so frequently that it must be regarded as a common—not an exceptional—fact in the history of such cases ; and it may be displayed very readily by a comparison of the paralysed with the healthy limb. An induced current which causes violent contraction in the muscles of the healthy side awakens no movement in the wasted limb ; and *vice versá*, an interrupted battery current, which is too feeble to cause any contraction in the healthy muscles is sufficient to produce distinct action of the wasted muscles. There would appear, therefore, to be an exalted readiness of response to one form of electricity, a diminished readiness of action to the other. This condition is not limited to the paralytic state I am now describing. It has been observed in other diseases by myself, and by my friend, Mr. John Netten Radcliffe, who will, I hope, furnish the results of his large experience in this matter in a collected form.

The *sensibility* of the skin in the paralysed limbs I have examined very carefully, and have found it to be normal, when tested by the compasses, by the application of heat or cold, by pinching, pricking, and the electric brush.

The *reflex motility* has been, so far as I have seen, utterly abolished in those limbs which have been completely paralysed to the will.

The *temperature* of the paralysed extremity has been reduced in all the cases that I have seen. This reduction has been obvious to the hand, and has been verified by the use of the thermometer. I have found a difference varying from five to nine degrees Fahrenheit between the limbs of the same patient, and this after taking the utmost care to avoid sources of fallacy.

The state of *mind*, and of the *general bodily health*, may be, and usually is, that of perfect health ; and it is almost infinitely rare to find anything like bedsores, or localised malnutrition of the skin.

4. *Consequences of paralysis.*—These are either simple uselessness, and all the discomforts which may follow therefrom in paralysis of any kind; or they are certain deformities which arise from the peculiar distribution of the paralysis and wasting. It is not my purpose to give you any description of these deformities, but you will at once see that they are the most marked when the paralysis is limited to particular groups of muscles; for then the antagonists of those muscles are thrown into overaction, and distortion of the limb is the result.

5. *Anatomy.*—The *muscles* and *bones* are small, and the former often lose all their characteristic structure; and, until recently, it has been affirmed that beyond these changes in the limbs nothing abnormal was to be found. You may read descriptions of post-mortem examinations in which it is stated that the brain, spinal cord, and nerves were in their natural state; and it is only of late that, by a process of more minute investigation, the real nature of the malady has been discovered. M. Laborde has shown that there is a distinct change in certain portions of the *spinal cord;* that the anterior columns are more translucent than natural, and present a very appreciable greyish-rose tint to the naked eye; and that a similar change may be observed, although to a less degree, in the lateral columns. The consistence of these tracts of nerve-tissue is diminished; and upon microscopic examination there may be observed a marked proliferation of the elements of the connective tissue, cells and nuclei being dispersed in the midst of a finely granular substance,

in which there are fibrils of extreme tenuity. In the parts which are the most affected nervous tubules are either lost altogether, or they present a varicose appearance; while the other portions of the spinal column preserve a perfect integrity.

6. *Treatment.*—There is nothing special to be observed in the treatment of the early febrile symptoms; but it is of the very highest importance that the nature of the affection should be recognised as soon as possible, and that the paralysis should be encountered vigorously.

The treatment which has been the most efficacious has been the judicious use of electricity—viz., its application, in proper forms and in suitable intensity, to the affected muscles. It often happens that, as in the case of G. H., which you have lately seen, the recovery is complete; and this after several years' duration of the paralysis. The most efficacious application is that of the interrupted battery current; and a curious fact is commonly elicited by its continued use. You find, for example, a group of wasted, palsied muscles, inactive to faradization, but responding readily to galvanism. You apply galvanism on several occasions, and observe that gradually some voluntary power returns, and with this a diminution of response to the agent you are employing. The same muscles were unaffected by faradisation at the first; but now—as their voluntary power returns and their contractility to the battery current diminishes—they act readily when the induced current is applied. At this period in the history of a case I have found it desirable to change the form of electricity, and to employ faradisation, carefully avoiding the use of such power as shall cause pain to the patient. Galvanism requires most patient exhibition in cases of this kind: for many months it should be continued, provided that there be the smallest improvement in voluntary power, or in the nutrition of the limb. When, after six or eight applications of both faradic and battery electricity, there has been no appearance of electric irritability, I have seen no good result from its continued use. It is probable that, under such circumstances, the muscles are so changed in structure, or, rather, so thoroughly destroyed in proper texture, that nothing can restore them; and the only thing that can be done is to prevent the deformity which might arise from the unopposed action of those other antagonistic groups of muscles which yet retain their integrity.

Electricity may have its action assisted by frictions and passive movements; but I have not seen any definite result, *quoad* the paralysis or wasting, from the exhibition of drugs. Of course, if the child be out of health, you would do your best to bring it into a more favourable condition; and in one case you would give alteratives, in another iron, in a third cod-liver oil, and the like. But your main object must be to treat the muscles, and to treat them without delay.

7. Your *prognosis*, in a case of infantile paralysis, is bad when the loss of voluntary power is absolute, when the wasting is extreme, and when, after three or four applications of electricity, you can detect no trace of contractility in the muscles. It is bad under such circumstances whether the disease be of old standing or of comparatively recent development. On the other hand, if some slight voluntary power remain, or even if, when it be lost altogether, you still find in the wasted limb some flickering contraction as you apply the battery current, you may confidently expect a cure or a notable improvement, although the wasting and the paralysis may be highly marked, and although they may have existed for many years, provided that you will persevere steadily in directing the course of treatment that I have described.

Even at the very onset of the malady you may form some notion of its probable severity by regarding the intensity of the initial fever: and you may, when the paralysis is passing into its period of localisation, ascertain by an electric examination the direction in which the malady will throw its strongest forces. Thus taught, you may often prevent the occurrence or full development of symptoms which are very obstinate when once established, and may relieve your patient, by the treatment of a few weeks, from that which, if once firmly rooted, may require twice as many months to cure.—*Lancet, July* 11, 1868, *p.* 35.

14.—ON COMPRESSION OF THE BRAIN.

By JONATHAN HUTCHINSON, Esq.

[The symptoms given by most writers as those indicative of compression of the brain may much mislead us in practice. This is especially so in cases of injury to the head, in which if we rely upon them we are liable to overlook compression in nine out of ten cases in which it is present.]

We must include under the term "symptoms of compression," all phenomena which are due to the squeezing of the contents of cranium. Now it is clear that there must be various degrees of it, and my first objection to the above description is, that if it applies at all, it applies only to the more advanced ones. Yet it is clear that one whose cranial cavity has been encroached upon to the extent of but one ounce, from effused blood, secreted pus, or depressed bone, must have his brain and its normal fluids (blood and cerebro-spinal serum) correspondingly compressed and diminished in volume; and that one in whom the encroachment amounts to two ounces ought to have double the inconvenience and so on, until the continuance of the functions of life is no longer possible. Writers ought, therefore, to be able to assign the symptoms of slight compression of the brain as well as those of the advanced degrees, for it may be that treatment is more important in early stages than in later ones.

Another distinction which we ought to make, is between general compression, or squeezing of the whole cerebral mass, and local compression of some one part. We must also think, in cases in which foreign materials are intruded into the cranial cavity, of the effects likely to be produced by stretching as well as by squeezing. In many positions, pressure upon one part would inevitably cause stretching of others, such as nerve-trunks, or commissural bands Lastly, we must remember that compression induced suddenly is a very different thing from compression taking place by slow degrees. If the increase in the quantity of intruding material be very slow, we well know that, unless some special nerve-trunks chance to be involved, no symptoms will be produced, even when the amount is very considerable.

Speaking generally, the effect of the effusion of new material, *e.g.* blood, into the cranium, will probably be first to eject a corresponding quantity of normal fluid in order to make room. Thus, the quantity of cerebro-spinal fluid will diminish, and also the quantity of circulating blood, and the capillary circulation will be diminished. The venous circulation will be retarded, but probably the whole quantity of venous blood will not diminish nearly so early nor so much as that in the arteries. Many of the venous sinuses are protected from pressure, and the effect of pressure at the exit of a sinus from the skull would be just the opposite to that upon an artery—it would keep the blood in the vein, whilst it would keep it out of the artery. We may suitably remember the phenomena of glaucoma, as illustrating the effects of pressure on arteries and veins. It is, I think, perfectly clear that a squeezed brain must be, *quoad* the supply of arterial blood, an anæmic brain.

The degree of pallor will vary with the degree of compression. We have to ask next as to the conditions of local and of general compression. All forms of compression taking place suddenly, will, for a time, be chiefly felt locally, and will have the usual symptom of local lesion, namely, a local paralysis or paresis. The portion of brain close to the compressing cause will be displaced and squeezed. After a little time, however, the adjacent portions of brain will yield, so as to accommodate the displaced portion, and the compression will become diffused and comparatively slight; so slight that its symptoms may wholly disappear. Only in certain positions, as for instance, of the cerebellum beneath the strong tentorium, is it possible that local pressure can continue permanently without becoming diffused. Pressure on any part of either hemisphere of the cerebrum will certainly, after a while, influence the other also. Clinical experience amply verifies this inference. I must again remind you that we must observe the distinction between mere pressure and stretching, and also between pressure upon nerve-trunks and pressure upon the central masses. In the case to which I have referred in the foot-note, the pupil of one eye became dilated and fixed, but this was clearly due to the local pressure of the blood-clot upon the trunk of the third nerve at the sphenoidal fissure. If blood be freely effused at the base of the brain, as from rupture of the basilar artery, it will lift the medulla and pons away from the bone, and by stretching the fibrils of the pneumogastic, speedily cause death without producing any general compression.

Examples of unmixed compression of the brain are very rarely met with. In the great majority of cases the injury is complicated, both by severe concussion and by laceration of the brain, and a mixed group of symptoms is the result. In the description which I have quoted, it is said the phenomena of compression "are those of apoplexy." Surely, however, the symptoms of apoplexy are most varied, and are, further, but rarely due to compression. In ordinary apoplexy some portion of the brain mass, often the thalamus or corpus striatum, is ploughed up by the extravasated blood, and the resulting hemiplegia is due to the laceration rather than to the effusion as a means of compression. Just so in the numerous cases in which injuries to the head are productive of laceration of the brain, and its concomitant extravasation into the arachnoid sac. My belief is, that in all these cases, the laceration is the far more important agent as regards the symptoms which follow. This is, I admit, difficult of proof, but I shall adduce cases showing, on the one hand, that severe lacerations, under conditions in which compression is impossible, are still attended by the symptoms referred to, and that, on the other hand, effusions of blood without laceration, if not of very great extent, cause no appreciable disturbance. Amongst the causes by which compression of the brain may be produced, we must mention 1st, extravasations of blood, (*a*) between the dura mater and bone. (*b*) into the arachnoid sac, (*c*) into the cerebral substance; 2nd, inflammatory effusions,—whether serum or pus, into any of the three situations just mentioned; 3rd, the growth of tumours; 4th, the depression of large portions of bone.

Respecting the last of these I would venture to assert that it is very rarely indeed the cause of symptoms. The portion of bone depressed must be very large indeed, which could cause symptoms of compression. In ordinary cases the extent to which the cranial cavity is diminished by a depressed fracture is very trivial, as any one may convince himself who has opportunities for examining such skulls from within before the fragments of bone or the dura-mater have been disturbed. In all the cases of extensive depression which I have seen, the so-called symptoms of compression were wholly absent. Cases of severe fracture with depression are almost always attended by laceration as well, and the symptoms of the latter lesion have, I feel convinced, been often mistaken for those of compression.

[Here follows a series of most interesting cases, to which are appended the following concluding remarks]:

You will have gathered from the cases which we have narrated that the diagnosis of compression is full of difficulty. On the one hand, compression is frequently suspected when it is not present, and on the other, it is sometimes overlooked when really there. In surgical practice we have to be prepared for it under several different conditions, to say nothing, for the present, of certain others, perhaps more common, which chiefly concern the physician. *First*, we have the cases in which it comes on from effusion of blood between the dura mater and bone, after injury to the head; *second*, those in which it results from extravasation into the arachnoid sac; *third*, those from abscess between the dura mater and bone; and *fourth*, those from inflammatory effusions within the arachnoid or into the brain substance.

I will take these *seriatim;* and first, those from *Effusion of blood between bone and dura mater.* These are especially important, because generally supposed to be capable of relief by treatment. Yet it is a remarkable fact that the modern annals of surgery do not, as far as I am aware, contain any cases in which life has been saved by trephining for this state of things. I suppose the fact is, that death usually occurs too quickly and too suddenly to permit either of diagnosis or treatment. The symptoms of compression are not present at first; the patient is merely confused, as if from slight concussion, and when more urgent conditions supervene, he dies very quickly. The symptoms preceding death are not, as we have seen in several very definite cases, those which have formerly been held to denote compression. The patient, it is true, becomes insensible; but he is pale, with dilated pupils, a rapid, feeble pulse, and irregular respiration. The "stertor" is only present at times, the countenance is not "bloated," and the pulse is far from "laboured." As for the relaxation of sphincters, &c., there is no time for such symptoms to show themselves, for the patient will probably be dead in an hour. Sometimes the condition comes on, as it were, by two steps, there being two separate effusions of blood. The first makes the patient heavy and stupid, and, it may be, causes a temporary and incomplete hemiplegia, the second kills him quickly. The more carefully we study this group of cases, the higher value shall we be inclined to put upon the previous history of the case as a means of diagnosis, and the less shall we rely on the symptoms. The importance of an interval of immunity between the accident and the occurrence of symptoms has been long recognised as the chief indication of a ruptured meningeal artery; and it is to this, almost exclusively, that we must still give attention, if we wish to diagnose these cases. Unfortunately, it is not always that we can get correct statements as to the early symptoms; but whenever there is clear testimony as to complete immunity at first, and the symptoms have come on suddenly, and at too early a period for the development of inflammation, then we may, with tolerable confidence, infer the existence of hemorrhage. The period at which the hemorrhage occurs may vary in these cases, just as it may after wound of an artery in one of the limbs. It is rarely profuse enough at first to cause symptoms. It may increase in the course of a few hours, or it may burst out suddenly, as a sort of secondary hemorrhage, at the end of one or two days afterwards. In rare instances it may even be delayed for a week, just as a wounded artery at the wrist may bleed after a similar interval. When it is sufficient in amount to squeeze the blood out of the vessels of the compressed brain, then symptoms will occur such as we have described in detail in several cases.

Our inferences as to the side on which the blood-clot lies will be helped by observation of the hemiplegia (if it have been present), by the dilatation of one pupil, and the examination of the scalp. The hemiplegia will be on the opposite side; a fixed dilated pupil will, I think, generally be present on the same side, and a puffy swelling in the scalp will often be found directly over the fracture.

Even if a case of this kind have been recognised in time for an operation, our embarrassment does not end here. It is very likely that difficulty might occur in finding and securing the injured part of the vessel, whilst, also, the removal of a blood-clot from the sphenoidal fossa (its usual position) might be no easy matter.

The second group of cases—*those in which the blood is under the dura mater*—may, in rare instances, resemble in every feature those just described. If a large superficial vessel have been injured, it is possible that an interval may occur, and then a large clot be poured out. More usually, however, these cases are complicated by laceration of the brain, and the symptoms of severe concussion are present from the first. The bleeding usually takes place, not from one large vessel, but from many small ones, and hence it is poured out with much less of compressive force, and ceases much short of the results which a ruptured middle meningeal can produce. The patient may therefore live much longer, remaining throughout insensible, and with the stertor, laboured pulse, and flushed face formerly held to be universal in compression. The marked inequality in size of pupils, which we have noted in the subcranial cases, will rarely be present, nor will hemiplegia usually be marked.

Our third group is a very important one, because, although rare, it is one in which a correct diagnosis would probably lead to a method of treatment which would save the patient's life. We may encounter *large collections of pus between the dura mater and cranium*, either as the consequence of chronic caries (syphilitic), or of injury ("Potts' puffy tumour" cases). When it occurs slowly, intense pain, gradually increasing in spite of treatment, wearing the patient out by loss of rest, but unattended by paralysis of any kind, will probably be the chief symptom. The increase of effusion will be slow, and the brain will accommodate itself to the pressure. It is possible, however, that special nerve-trunks may be compressed or stretched. Towards the end of the case the patient—emaciated, exsanguined, and reduced to the last degree of weakness—will probably become comatose, the coma being possibly ushered in by convulsions. The cases of abscess between the dura mater and bone, consequent on fracture or contusion of the skull, will be exceedingly difficult to distinguish from those of arachnitis. Arachnitis is infinitely the more common result of such injuries; and you are aware that I have recently asserted and, I think, proved, that hemiplegia is its usual symptom. In these cases there is almost always a little lymph or pus between the bone and membrane, but no collection which you could let out by trephining. If you adopt the rule of trephining in all cases in which, after bruise or fracture of the skull, the patient has become hemiplegic or comatose, with inflammatory symptoms, you will operate in twenty cases of arachnitis for one in which you will find any considerable collection external to the dura mater. Nor is it, as far as I can see, possible to assign any symptoms which will materially help in the differential diagnosis. The more definite the hemiplegia may have been, and the longer the time during which it has preceded the coma, the less likely is it that there is pressure, and the more probable is the diagnosis of arachnitis. If the patient have had rigors of a definite character, the diagnosis of osteitis, thrombosis, and pyæmia may be given, and whatever the position of the inflammatory effusion, your operation will be bootless.

If the diagnosis of compression from abscess between bone and membranes, after injury to the skull, be difficult, that of *compression from arachnoid effusion, or from abscess in the brain*, is yet more so. Indeed, if it be true (as I believe) that the contact of inflammatory secretions with the surface of the hemisphere, without mechanical compression, may induce hemiplegia, it is clearly impossible to tell whether the latter condition is superadded or not. Nor is this diagnosis of much importance in practice. The symptoms which result from abscess in the substance of the brain vary so much in different cases, that it is impossible to be precise in regard to them. Incomplete hemiplegia of the opposite limbs, with attacks of spasms, with headache, and later on, tendency to coma, are probably the chief. Should these symptoms follow a known punctured wound of the brain, trephining and perforation of the membranes and brain may be justifiable.

You will have noticed that I have said nothing as to depressed bone as a cause of compression. I have omitted it, because really I have nothing clinical to tell you about it. I have never seen a case in which there seemed definite reason to think that depression produced symptoms. Where the depression is very great, and the fragment very large, it is possible that symptoms may be caused, but I have not myself seen a well-marked case. That our common cases of depressed fracture should be attended with symptoms of compression it is absurd to expect. The fragments rarely intrude into the cranial cavity sufficiently to displace more than a few drachms of fluid, and probably a displacement of not less than two to four ounces is required for compression. I have, of course, seen plenty of cases of depresed fractures with head symptoms; but in all, the symptoms were those of severe concussion, or of lacerated brain, and not those of compression. The practice of trephining and elevation is, I think, strongly to be recommended in all cases of compound fracture with depression; but it is in order to prevent inflammatory symptoms, not to relieve an imaginary state of compression of the brain.—*Clinical Lectures and Reports of the London Hospital*, 1867-8, *p*. 10.

15.—ON DELIRIUM TREMENS.

By Dr. Samuel Wilks, Physician to, and Lecturer on the Practice of Medicine at, Guy's Hospital.

Now, after speaking of the slow destruction of the brain-tissue by a chronic inflammatory process, let us look at the case of a more simple atrophy. In the disease we have just left—the general paralysis of the insane—there is not only loss of bodily and mental power, but the manifestations of the latter are peculiar. In simple wasting of the brain, however, there appears to be only a gradual failing of the physical and intellectual functions. See a man, for example, tottering along, scarcely able to support himself, or "all of a tremble," and his mind at the same time impaired—that man, if the symptoms have existed for any period, has an atrophic brain. This may have been the result of age, and he may be approaching a second childishness or mere oblivion; but if he be a young man, it arises from disease, and in all probability, from intemperance. Certainly one of the causes most frequently instrumental in the production of an atrophy of the brain is drunkenness or the excessive use of alcoholic drinks. Alcohol, as you know, causes a degeneration of all the tissues of the body. By its direct effect on particular organs, you may find an increase of the connective or fibrous tissues, and then a cirrhosis of the liver, a Bright's kidney, or a so-called chronic pneumonia may arise; in other instances a fatty degeneration of the tissues occurs, and thus death by diseased heart is very frequent in the drunkard. These two morbid processes are, however, often combined; but, whatever may be the exact pathological change, the result is the decay of all the tissues and organs of the body. It is remarkable how many morbid processes resemble those which naturally take place in advancing age, and thus a disease will by its effects, add so many years to a person's life. A drunken man is literally living too fast.

There are of course other circumstances which tend to this general and nervous decay; but I think in most instances, as you have often heard me say, if you see a man come staggering in amongst our out-patients, the probability is that he has been taking too many so-called "strengthening things" all his life. If you find this so, and he is bodily and mentally incapacitated, that man has assuredly an atrophied brain. If you examine the body of a man who has died of delirium tremens, you find the effects of the long-continued stimulus on his organs; and, as regards his brain, that has a very striking appearance—the membranes are thickened, and the convolutions are much shrunken, so that there are deep sulci on the surface, and in these a quantity of fluid. Sometimes three or four ounces of serum are seen, taking the place of so much good brain which has disappeared. The figurative expression which Cassio makes use of when speaking to Iago contains a solid and substantial fact —"O God! that men should put an enemy in their mouth to steal away their brains!" The brain, then, of a confirmed drunkard is an organ which is shrunken, and weighs so many ounces less than it did when healthy. All its functions, also are becoming enfeebled, and those qualifications which should have preserved to its owner the name of lord of the creation have disappeared, and he has become, in common parlance, a good-natured fool. Call such a man a brainless sot, and you have his exact condition —the sot implying a man stupid with drink, and the "brainless" imparting to the term his true pathological condition. It is such a brain as I have mentioned that you find in those who have died of delirium tremens. The earlier attacks of the drunkard are recovered from; but there comes a time when the last and fatal one arises. But then his death is really due to the degeneration of tissues which long-continued habits of intemperance have entailed.

Take a man who, from his addiction to alcoholic drinks, has the weakened brain that I have described, and let any unusual stimulus act upon it, he loses his balance, and he is thrown into the state known as delirium tremens. This is my idea of the disease. I believe some medical books state that delirium tremens is a train of morbid phenomena produced by the slow and cumulative action of alcohol. This, however, I cannot admit without some modification, for it might imply that delirium tremens was due directly to stimulation of the brain. There is, no doubt, a morbid condition set up by alcohol, but this would be *delirium è potu*, or simply intoxication, or poisoning by spirit. I believe, however, that such an opinion as I have mentioned does largely prevail—*i.e.*, that the brain is over-stimulated by the artificial excitement, and that a sudden deprivation of this starts the disease into life. My own strong conviction is, that such an opinion is highly erroneous, as well as the treatment which it necessarily involves —viz., that the stimulus must be restored, and the excitement abated by opium. I believe firmly that such opinion and the conclusions which flow from it are erroneous and mischievous.

My own idea is that the brain has been previously brought into an impoverished state by the continued debauchery, and that, thus weakened, it is ready to be further disturbed by any fresh excitant, whether this be a mental trouble, an accident, or, more probably, an extra amount of the alcoholic stimulus. I am led to this opinion because, in the intervals of the attacks of delirium tremens, the patients present the symptoms I have before mentioned, a mental and physical weakness as a result of the chronic pernicious effects which are being produced on the brain, and also because I observe the circumstances which excite the attack. The cause may be an accident or an acute disease suddenly set up, but more generally we find that the patient has been out with his friends drinking for two or three days in succession, and if he has had any troubles in business this would only be a still further excitant cause. On the other hand, I never hear of a man suffering delirium tremens from having got drunk only once, nor do I hear of it in the habitual drunkard from his having left off the accustomed stimulus. I have never witnessed such a case myself, and I have taken the trouble of inquiring of those who have had an opportunity of seeing persons habitually intemperate, and who have been placed on a bread-and-water diet, and I am informed that such persons do not have delirium tremens. I have myself on several occasions recommended or insisted upon the withdrawal of ale, wine, and spirits from those who had been endeavouring to live upon these stimulants, but never witnessed anything like delirium tremens result. Why I insist more especially upon the importance of having a true conception of the disease is that an erroneous one carries with it a very harmful treatment. The one theory suggests a continuance of the accustomed stimulus; the other its withdrawal and repose for the excited and wearied brain. Delirium tremens is not so simple a disorder as you may imagine; each case requires a study and its appropriate remedies.

Having given you a clue to its pathology and treatment, I have said all that is important. As regards the symptoms several very graphic accounts have been written, and some by those who have suffered all its horrors. I might say in a few words that a man suffering from delirium tremens has generally already shown symptoms of a weakened brain by his tremor and want of mental vigour. When you are called to see him in the attack, you generally at once see the nature of the case; he is probably up and dressed; he may indeed be attempting to conduct his usual business—in fact, he generally has a great desire to be about his accustomed avocations; he is constantly moving and wanting to go somewhere or do something which his friends are as constantly desirous of preventing. As you speak to him he is sufficiently intelligent to know you and sit down for a moment and converse, but it is only for a moment; his restlessness prevents him remaining quiet, and his mind then rambles on all kinds of subjects. If you place him in bed, he constantly jumps up, and is suspicious of those around him, or fancies that he sees objects in the corners of the room; if the bed be surrounded by a screen, then he sees imaginary cats and dogs on the bedclothes, and will attempt to stroke them, or sees creeping things like spiders; or he stretches out of bed to look beneath, fearing there are persons hidden there. All this time he is constantly fidgetting his hands, and perpetually jumping up and lying down again; his pulse is quick, his tongue is furred, and he is bathed in perspiration.

When I say such a case is easily recognised, I mean with care, for I have constantly seen mistakes made with reference to diagnosis. I have seen general paralysis of the insane styled delirium tremens by the same physician on two different occasions. In the surgical ward of a hospital, cases of injury to the head, followed by arachnitis, or effusion of blood on the surface of the brain, are extremely likely to be called by this name. Acute disease, as pneumonia, occurring in a person of intemperate habits, is masked by the delirium, and the primary disease may be overlooked. Typhus fever I have seen styled delirium tremens; and there is one disease which certainly puts on an outward form very like it—I allude to the case where cerebral symptoms accompany pericarditis. A patient, for example, has acute rheumatism, followed by inflammation of the heart, and, in some cases, most remarkable nervous symptoms ensue—the patient is delirious, is in constant movement, and bathed in perspiration—he resembles exactly, indeed, the case of delirium tremens. In this case the stethoscope placed over the heart would insure to the listener a true knowledge of its nature.

It is important also to know what is the condition of the patient generally who suffers from delirium tremens, for on the state of the organs the prognosis mainly depends. He may have cirrhosis of the liver, or, what is not uncommon, Bright's disease of the kidney. If the patient have convulsions, you may find that the urine is albuminous, and this of course must endanger the case. Convulsions, I might say, however, often occur independently: they may be due to the wasted brain, or be temporary and due to the recent debauch.

Now, as regards treatment, the most important instruction I can give you is what *not* to do. Do not, in the first place, regard delirium tremens as a disease due to the sudden withdrawal of an accustomed stimulus, and therefore commence the treatment with the administration of wine or spirits—you will by so doing add fuel to the fire—but look upon the attack as due to excitement acting on a previously weakened brain. Then your mode of treatment is obvious and rational. In one word, get your patient repose. Now I do not mean by this that your remedy is simply opium to procure sleep, but I use repose in a much larger sense. I have frequently seen a patient, probably a publican, sitting in a large room surrounded by a dozen friends, male and female, who are talking to him or holding him in restraint. He is bathed in perspiration, his pulse is very quick and feeble; the doctor says he has not slept for two or three nights, and he dare not give any more opium, as the pupils are already contracted. His fears that the man will die seem not ill-grounded, since it is impossible to suppose that any mortal man could go to sleep under such circumstances. I have seen such a patient then removed to a small room, put to bed, and go off to sleep in half an hour.

Therefore I say that the most judicious treatment is required for delirium tremens, and do not go away with the notion that all you have to do is to give opium to procure sleep. I have many times seen the last sleep produced by it. And do not, as I before said, continually give stimulants to "keep up" the patient, for I have constantly seen the complaint strengthened by these means. I do not wish to reflect on the opinion of others, because I state strongly my impression that the disease is not to be cured off hand by medicine. I see a great deal of this disease, and the time at which I am called in is about the third day, when, all means having been found unavailing in checking the complaint, another opinion is sought; after this time the patient usually sleeps and does well. I think then, except in very slight cases where a single dose of opium procures rest, that a certain interval must elapse before the commotion subsides; that in a bad example of the complaint the symptoms will continue without abatement for three days at least. This is my experience under all modes of treatment. I have no objection to opium, but it must be administered judiciously; if you act on the principle that sleep must be procured at all hazards and as soon as possible, you will without doubt kill many of your patients. In the first instance you should place your patient in a small quiet room, and get rid of a number of officious friends.

As regards medicines, you must be guided by circumstances. I have often prescribed with advantage the well-known mixture of twenty drops of antimony wine and tincture of opium every four hours, keeping up the patient's strength by beef-tea. If you can give a glass of wine or beer in the form of nourishment without its producing any injurious stimulating effects, I have no objection; but, as a rule, I advocate the plan of giving none. Instead of administering antimony, you might give the laudanum, or small doses of morphia with ether or ammonia, and, at the same time, support the strength of the patient. By judicious management of this kind you will find your patient recover in three or four days, unless, indeed, he be extremely diseased in consequence of his former dissipations. As regards restraint, I have often heard objections made to it, but I believe it is often necessary, and its adoption is a real kindness to the patient. He may wander about his house until he drops dead from exhaustion, when a forcible restraint in bed by a sheet across the chest might procure rest for the body, and often for the brain. Remember, then, your patient wants repose; do not be content with administering opium and neglecting every measure which common sense would say was necessary to give any man a night's rest. As regards chloroform, you may quiet the patient by it for a time, but you do not in any way influence the disease. Other remedies are advocated. When digitalis was first proposed, I gave it to a man in large doses, and, he having unfortunately died, I have never felt myself justified in administering it again. I have seen enough of the sedative effects of the wet sheet to fully believe the statements which have been made as to its efficacy. You strip the patient naked, roll around him a wet sheet until he looks like a mummy, then a blanket around this again. In many cases of delirious excitement, you will find that, as soon as a hot vapour surrounds the patient, he sinks into a quiet sleep.—*Med. Times and Gazette, Sept.* 19, 1868, *p.* 327.

16.—FARADISATION IN THE TREATMENT OF PARALYSIS.

By J. NETTEN RADCLIFFE, Esq., Medical Superintendent of the National Hospital for the Paralysed and Epileptic.

[Of the three forms of electricity used in medicine, viz., frictional, chemical, and induced, the nomenclature has given rise to a good deal of discussion.]

It seems to me that it would be an advantage to have a series of terms which, while securing the object which Duchenne had in view, would be free from the objections referred to. The electricity of chemical action is more correctly and generally designated, after the name of the original discoverer, Volta, *voltaic* electricity. Faraday suggested that fractional electricity should be termed after the illustrious philosopher, Franklin, whose name is especially connected with its early experimental study, *franklinic electricity*, and the name is now being widely adopted by physicists. By applying the method of terminology which Duchenne has so happily used in respect of the induced current to the other forms of electricity, a series of terms is obtained which would be accurate in form as the practice of nomenclature goes, true to science in fact, free from confusion, and particularly convenient in usage. The series would be, (1) *faradaic electricity*, or *faradism*, and, as respects the pathological and therapeutical application of the agency, *faradisation:* (2) *voltaic electricity* or *voltaism; voltaïsation: (3) franklinic electricity* or *franklinism; franklinisation.*

Faradisation.—A faradaic apparatus, of one kind or another, when the diagnostic and therapeutic value of faradisation are more widely understood, will become as necessary a part of the practitioner's armament as a stethoscope, or an opthalmoscope, an otoscope, or a laryngoscope. By the aid of such an apparatus certain special peculiarities of several forms of paralysis, a knowledge of which is essential to the proper treatment of the diseased state, can alone be detected. To the right use of faradisation it is necessary that an instrument should possess certain fundamental requisites. These are :—a sufficient range of power, so as to bring at once, and when properly applied, the largest muscles into full and energetic contraction ; easiness and a certain niceness of graduation ; and immediate readiness for action, and capability of being placed out of action without involving trouble and loss of time. The form of apparatus which is excited by a permanent magnet (*magneto-faradaic*) possesses the first and last of these requisites, but, except in the more elaborate instruments, is deficient in the second ; but the facility of use of a magneto-faradaic apparatus is greatly impeded by the need of a second person to work it. The form of apparatus which is excited by a voltaic cell (*volta-faradaic*), as ordinarily made, possesses the first and second of the requisites named, but is seriously defective in the third. A volta-faradaic apparatus has, however, been constructed by Stöhrer, of Dresden, which possesses to the fullest extent even the last-named requisite, and which is unquestionably the best and most efficient apparatus for medical purposes yet constructed. This apparatus possesses not only the fundamental requisites which have been enumerated, but also the principal refinements which give an apparatus additional value.

The chief peculiarity of Stöhrer's volta-faradaic, or, as he terms it, induction apparatus, consists in the arrangement of the cell. The elements are formed by a hollow cylinder of carbon, surrounded by a cylinder of amalgamated zinc. The hollow of the carbon is partly filled with fine glass sand, charged with from fifteen to twenty drops of a saturated solution of chromic acid. Both elements dip into a glass jar containing diluted sulphuric acid (one part of the acid to six of water). This jar is moveable, and it can be raised so as to immerse the elements or dropped so as to leave them free from the acid. By this ingenious arrangement, the apparatus can be brought into or put out of action at a moment's notice ; and there is this that is remarkable about the combination of elements, that even with frequent daily use they retain their power, and act well for from six to eight weeks, and with care for even a longer period. Moreover when the action is exhausted, the re-amalgamation of the zinc and re-charging of the cells are barely a quarter of an hour's work. The induction coils do not differ from those of other well-made volta-faradaic apparatus, except in the mode of packing, and certain elaborations of accessories. Stöhrer makes two kinds of volta-faradaic apparatus, a larger and a smaller. Both are excellent instruments, and both are portable, but the larger is by far the best and most complete.

The currents derived from both the magneto-faradaic and volta-faradaic apparatus produce the same physiological effects when transmitted through a part of the human frame. They equally excite the sensitiveness of the sensitive nerves lying in their track, as shown by pain or other modifications of sensation, and bring into action the contractility of the muscles. These physiological phenomena lie at the root of the therapeutical uses of faradisation, and medicine is indebted to Duchenne (de Boulogne) for first showing in what manner they may be best elicited and applied in the treatment of disease. He has shown that when metallic conductors are used, according as they are applied to the surface of the body uncovered and dry, or tipped with layers of moistened leather or sponge, the electrical current may be limited to the skin and tissues immediately subjacent, or made to pass to the deeper-seated structures, and localised in definite muscles or groups of muscles. This constitutes what Duchenne has termed *localised electrisation*. By this method it is practicable to determine easily and accurately, in the living, healthy subject, the action of the different muscles which can be reached by the electrical current; and this is what Duchenne has done in his two remarkable works, "Mécanisme de la Physionomie Humaine" (Paris: 1862), and "Physiologie des Mouvements" (Paris: 1867). By this method the state of motility of paralysed muscle can alone be determined in reference to the therapeutical application of electricity, and that application effectively carried out.

As regards the muscles, the method may be employed either *directly* or *indirectly*, that is to say, in the former case by applying the conductors directly over the belly of the muscle; in the latter, by acting upon its motor nerve when accessible. The direct method is that chiefly followed by Duchenne. He uses as conductors (or rather directors) instruments of various forms. These include a pair of sponge-holders for directing the current upon the larger muscles; a pair of button-headed directors covered with several layers of leather for localising the currents on smaller muscles; and an olive-shaped and a conical director, the heads also sheathed with leather, for localising the currents on the individual muscles of the face. In addition, he uses a brush of fine wire for localising the current in the skin. The form of the handles is such as to permit each pair of directors being manipulated by one hand so as to leave the other free. The directors are connected with the volta-faradaic apparatus by very flexible wires covered with silk, or cotton, or india-rubber. Before being used, the sponges or leather coverings are saturated with warm water in which a little salt has been dissolved. For therapeutical purposes, each muscle, or group of muscles, should be acted upon for about thirty seconds at a time, with intervals of a few seconds, and the whole period of application should extend from ten to twenty minutes as a rule.

The *therapeutical uses* of faradisation arise directly out of the physiological properties of faradaic currents. In respect of the muscular system, they rest entirely upon the power possessed by these currents of exciting muscular contraction, and the physiological consequences of such contraction, namely, increased growth and aptitude to action of the muscular tissue. The reaction of muscles against a faradaic current—the *electro-motility* so called—is unaffected, or it is variously modified in certain paralytic affections. When the electro-motility is normal, as in paralysis of cerebral origin, faradisation cannot make the contractility of the muscles more normal; and, as a rule, it is useless. When the electro-motility is diminished or exhausted, as in certain forms of spinal and local paralysis, faradisation may reinvigorate or recall the defective or lost motility. The broad rule for the application of faradisation in the treatment of paralysed muscles is, indeed, this:—*when the electro-motility is diminished or exhausted, then faradisation will be of service; when the electro-motility is unaffected it will not prove of any use.* The question then, of the use or not of faradisation in a given case of paralysis, involves a primary question of diagnosis; and this diagnosis is altogether special, and can be determined only by the systematic examination of the affected muscles. Such an examination excepting only in the ordinary forms of paralysis of cerebral origin, should be made in every case. The examination, however, it is to be repeated, must be of individual muscles, for in the forms of paralysis in which faradisation proves most beneficial, not all the muscles of an affected limb may be equally paralysed, and some may be unaffected while the motility of others is seriously damaged. To faradise equally the affected and the unaffected muscles—those muscles which are slightly and those which are much injured,—would be to do harm rather than good, and at the best would be a haphazard practice. The condition of muscle in which faradisation is found chiefly beneficial most commonly exists in paralysis following certain lesions of the substance of the spinal cord, the paralysis of infancy, and local palsies arising from injury of a nerve, or which are classed as rheumatic palsies. If, however, the practitioner follows the rule of guidance given above, he will have no difficulty in any given case of determining whether faradisation is needed or not in its treatment. The chief caution to be borne in mind is that in cases of centric origin *faradisation should not be had recourse to—or, indeed, any method of electrisation—so long as active mischief exists.*

Space does not permit me to do more than refer to the faradisation of the muscular tissues of particular organs, as of the bladder, the rectum, the uterus, the eyes, and the larynx, when the contractility of those tissues is impaired.

There are certain forms of *quasi*-paralysis in which the electromotility is intact. in which faradisation is of much benefit, although not so certainly or so surely as in cases of paralysis in which the electro-motility is impaired. The *quasi*-paralytic affections referred to are the so-called *wasting* palsy (progressive muscular atrophy) and local atrophy of muscles. In these cases, the paralysis of movement depends upon the loss of muscular tissue, that which remains acting normally under the faradaic contact, and as a rule responding to the volition. In some of these cases faradisation is an invaluable remedy, staying the onward progress of the wasting, and promoting the growth of the affected muscles.

As regards the *nervous system*, the most marked use of faradisation is in cases of local anæsthesia, particularly the local anæsthesia apt to occur in hysteria. In such cases the application of the electrical brush, or "whip," as some writers term it, is of great value.

The use of faradisation in certain perverted states of nervous and muscular action (neuralgia and spasm) is governed by general therapeutical principles rather than by any special remedial indication.

For a detailed account of the pathological and clinical conditions in which faradisation is useful either for the purposes of diagnosis or treatment, I must refer to the great work on "Localised Electrisation," by Duchenne (de Boulogne.)—*Practitioner*, *July* 1868, *p.* 18.

17.—TETANUS SUCCESSFULLY TREATED BY ATROPIA.

By Dr. G. Oliver, Redcar.

A healthy looking lad aged 14, was seized with lockjaw and severe pain in the cervical and dorsal regions, with fever, a few days after jumping from a coal-waggon. On my visit (fourth day of symptoms), I noted well marked risus sardonicus; incisors separable for less than half an inch; masseters rigid; cervical and dorsal vertebræ arched forwards; sterno-mastoids and muscles of back rigid; abdomen flat and hard; legs and feet rigidly extended; tenderness along spine; arms free from tetanic symptoms; paroxysms of severe general spasm every few minutes; pulse 140; sleepless. I ordered one-sixtieth of a grain of atropia every three hours; and linimentum belladonnæ to be well rubbed over the spine and rigid muscles every six hours.

Within twenty-four hours, the physiological action of atropia showed itself; then the clonic spasms became less severe, and of shorter duration; and the tonic rigidity gave way, first in the legs and neck, then in back, and last of all in abdomen and masseters. On the sixth day of treatment by atropia, rigidity of the masseters alone remained. He was kept under the influence of atropia for three weeks. He then quickly and completely recovered his usual health under steel and quinine.

It is said by Brown Séquard, that belladonna reduces congestion of the blood-vessels of the spinal cord and its membranes; that its principal physiological action is "spinal anæmia." I believe that the tetanic symptoms in this case depended on an excitability of the spinal cord, probably caused by "spinal congestion"—a derangement of the vaso-motor nerves of the cord and its membranes, which allowed more blood than normal to circulate through the contents of the spinal canal. If so, we have the *rationale* of the therapeutic action of atropia in this and allied cases.—*British Med. Journal, Aug.* 22, 1868, *p.* 184.

18.—ON THE EMPLOYMENT OF PHYSOSTIGMA (CALABAR BEAN) IN THE TREATMENT OF TETANUS AND CHOREA.

By Dr. THOMAS R. FRASER, F.R.S.E., Assistant to the Professor of Materia Medica in the University of Edinburgh.

Tetanus appears to be, essentially, a disease characterised by an exaggeration of the reflex function of the medulla spinalis, medulla oblongata, and certain lobes at the base of the brain. A close analogy exists between it and that condition of exaggeration of reflex excitability which is produced by the action of strychnia. This supports the idea that, although tetanus may be often due to appreciable lesions of the central nervous system, either connected with, or independent of, irritating diseased conditions of the peripheral nerves, it may also exist without any discoverable central lesions. Exaggeration of the reflex function of the central nervous system, resulting in spasmodic contractions, appears to constitute its essential character. Hence its most successful treatment seems to have been by the employment of such means as remove the condition of exaggerated reflex excitability, or oppose its manifestation. Warm baths, sudorifics, and the application of ice to the spine have been used at various times and with varying success; and numerous cases have been recorded in which sedative drugs were used, such as opium, aconite, belladonna, tobacco, and curare, and the active principle of these. None of these drugs has, however, produced such successful results as to become the established remedy for tetanus. A presumption of success might be supposed to exist in favour of several of them, and perhaps more especially in favour of those which powerfully impair and destroy the conductivity of motor nerves, such as belladonna and curare, or of those which combine a somewhat feeble paralysing effect on motor nerves with a more decided paralysing action on voluntary muscular fibre, such as tobacco; but they fail in this, that none of them possesses a primary and energetic sedative action on the diastatic function of the spinal cord. Opium, in certain circumstances, produces this effect, but it cannot be looked upon as one of its primary or leading actions, and it is complicated and even opposed by its other actions; for, with the exception of narceia, all the opium alkaloids produce more or less marked convulsant effects. It is probable, therefore, that its spinal sedative action, only exceptionally observed, is dependent on the narceia, but it is doubtful if this akaloid would be of any use in tetanus, as the powerful soporific action it is reputed to possess would obscure the effect on the spinal cord that is wished for.

Physostigma has the great advantage over all these substances of directly and powerfully diminishing the reflex activity of the cord. A description of the various data on which this conclusion is founded would occupy too much of the space at my disposal. I shall, therefore, assume that the evidence I have elsewhere published is sufficient to establish this effect of physostigma. The following experiments illustrate the power of this drug to counteract the tetanic symptoms of strychnia poisoning; and it is generally admitted that a very close analogy exists between these symptoms and those of tetanus itself.

"I placed a small drop of solution of strychnia (Brit. Pharm.) on the back of a frog. This produced tetanus in four minutes. When a considerable dose of physostigma extract was inserted into the animal's mouth, the manipulations necessary for its introduction excited a series of violent emprosthotonic spasms. Four minutes after the Calabar bean was exhibited, a decided diminution occurred in the frequency and severity of the convulsions; and, in nine minutes, they had lost their tetanic character. In forty minutes, it was difficult to excite even a faint reflex movement by pretty strong galvanism of any part of the body; and, soon after, reflex action had completely disappeared, even when the exposed sciatic nerves were galvanised."

The part which physostigma played in counteracting the tetanic effects of strychnia, may be readily shown by comparing this experiment with one in which the strychnia effects were not interfered with.

"A frog was selected of the same weight as the last, and in every other respect as nearly resembling it as possible, and a small drop of solution of strychnia (Brit. Pharm.) was placed on its back. Tetanus occurred in four minutes; and violent convulsions of a tetanic character followed each other at intervals, and could be excited by the slightest touch, during the next six hours, after which the observations were stopped."

In addition to this paralysing action on the spinal cord, physostigma diminishes and even destroys the conductivity of motor nerves. It thus includes among its therapeutic properties that which has recommended curare as a remedy for tetanus. It is, therefore, peculiarly suited to counteract such convulsive movements as result from an exaggeration of the reflex function of the spinal system. It is true, that it does not influence the afferent, or sensory, nerves, and probably its value would be enhanced if it diminished the activity of these. This effect might especially be valuable in such cases of tetanus as manifestly depend on an irritation of peripheral nerves. But there can be little doubt, that in these the primary irritation constitutes but a portion of the disease. The symptoms prove undoubtedly that the spinal cord is sooner or later affected. Tetanic convulsions or exacerbations of existing convulsions may be produced by sudden sounds, by unexpected sights, or by gentle touches of any portion of the skin, proving the existence of an abnormally excitable condition of the reflex centres, the result, possibly, but now independent, of persistent irritation localised in an injured afferent nerve. It cannot be ignored, however, that a persistent local irritation may occupy a position of such importance in the disease as either to interfere greatly with the prospects of successful treatment by such a remedy as physostigma, or altogether to prevent success. Several cases have been recorded where tetanus has followed injuries and surgical operations, and where important nerve lesions have afterwards unmistakeably indicated its cause. No great benefit can rationally be looked for in these cases from the employment of any drug. A necessary preliminary must always be the discovery of the lesions and their removal by surgical means.

Shortly after the recommendation of physostigma as a remedy for tetanus, a French practitioner, M. Lemaire, employed it in a case of the spontaneous or idiopathic variety of the disease. This was in 1864. It appears to have been the first example of this treatment, and was fortunately a successful one. In the same year, M. Giraldès, the accomplished surgeon of *l'Hôpital des Enfants* at Paris, narrated before the Surgical Society a case in which he had successfully used physostigma in tetanus. About two years after this, the value of physostigma in tetanus was successfully tested, for the first time in this country, by Dr. Eben Watson, of Glasgow,—a gentleman who deserves great credit for the ability with which he has investigated some of the physiological effects of this drug, and for the energy and skill with which he has advocated its application to the treatment of tetanus. Other nine cases have since been recorded.

[Dr. Fraser then relates twelve cases in which physostigma was used. Of these one was too far advanced before the treatment commenced, but of the remaining eleven, nine recovered.]

Dr. Bouchut's case is one that shows the urgent necessity of commencing the administration of this drug as early as possible, and of boldly increasing the dose until some decided effect is produced. Physiological chemistry teaches us that muscle itself produces, during its contraction, substances that cause it to contract. When the contraction is extremely energetic and continuous, these substances so accumulate as to cause a condition of persistent tetanus, independent of the nervous system for its persistence. Possibly the continuous rigor, especially marked in the muscles of the back, and occasionally described, in fatal cases, as passing directly into the condition of *rigor mortis*, may be greatly due to this circumstance. Our knowledge of this disease teaches us that the abnormally excitable condition of the reflex centres first manifests itself in limited portions, and gradually extends until it involves their whole extent. It is, therefore, of the greatest importance to diminish the frequency of the tetanic convulsions at as early a stage as possible. This, it is only rational to suppose, will be best done by the use of a substance that diminishes the reflex excitability of the spinal cord. Physostigma possesses such an action, and the experience gained in these cases proves that it efficiently exerts it in tetanus. I extract, in illustration, the following details from the account of Mr. Ashdown's case (Case 9):—

"October 6th.—. . . One third of a grain of extract of Calabar bean, dissolved in eighteen minims of water, ordered to be injected every two hours under the skin. The effect of the first subcutaneous injection was very marked. In about five minutes, the legs, which had been previously perfectly rigid and immoveable, became flaccid and freely moveable by the patient; the abdominal muscles became less tense, and the arching of the spine disappeared. The pupils also contracted, and the pulse sank to 82. The effects lasted two or three hours, and all the symptoms then reappeared" . . .

"October 7th.— . . . Every subcutaneous injection, which had been given regularly every three hours during the night, had been followed by an almost complete remission of the symptoms, lasting about two hours. . . .

"October 10th.—During the night, as the patient was very delirious, and the pulse had risen to 148,—effects supposed to depend on an overdose of the medicine,—the injections were stopped for seven hours. This morning, the vessels were as rigid as ever; and the paroxysms, which had almost ceased, again increased in frequency. The injection was ordered to be continued as before. In the evening, the pulse had fallen to 125, but the injections had been required every two hours, the effect not lasting so long as previously."

In the cases I have mentioned, physostigma was administered in very varying doses, and in numerous forms. Little benefit would, therefore, be derived from an attempt to establish any rules for its administration from the experience of these cases alone. I prefer to use this experience as merely a guide in preparing the recommendations I venture to make on the employment of this remedy in tetanus.

The British Pharmacopœia contains two preparations of physostigma, the powder and the extract. I think the powder should not be used, as there is considerable evidence to show that the functions of the stomach are impaired in this disease. By giving it we not only increase this evil, but we fail, on account of the comparatively slow action of the powder, in securing the important object of affecting the system as rapidly as possible. The extract should be always used, as it is the most concentrated preparation, and one on whose constancy we may rely. It may be given in the form of pill, or of solution and suspension in water (mixture), or of solution in weak spirit of sp. gr. 0·920, (thirty-two grains to the fluid ounce). I prefer the first and last of these forms, as that with water decomposes in a few days.

Physostigma may be administered by the mouth, anus, or subcutaneously; and the special peculiarities of each case will be the best guide in determining which of these should be used. I should myself feel inclined always to commence the treatment by subcutaneous injection, to repeat such injection until the system is decidedly affected, and then to administer the remedy by the mouth, in a dose three times as large as is found necessary by subcutaneous injection. Such a plan might be quite safely followed in a child of even nine years. If the remedial effects continue to be produced by administration by the mouth, it should be persevered with, for such administration has obvious advantages as far as the convenience of the practitioner is concerned. In the more severe cases, however, I believe subcutaneous injection should be alone employed. The distress and the increase of spasm caused by swallowing, or the impossibility of introducing substances by the mouth, will render this necessary. I cannot, also, urge too strongly that subcutaneous injection should always be used when severe and continuous spasms occur, when a fatal result is imminent from the exhaustion caused by prolonged and frequent convulsions, and when apnœa threatens at once to close the tragic scene. By it we obtain the quickest and most powerful effects. Administration by the anus will be rarely necessary. It may, however, be employed to relieve the stomach, and will then be occasionally useful.

From the preceding remarks, it cannot be expected that any arbitrary rules of dosage can be laid down. For an adult. one grain of the extract by stomach, or one-third of a grain by subcutaneous injection will be generally sufficient to commence with. This should be repeated in two hours, when its effects will usually have passed off, and the succeeding doses may be modified according to the experience that will thus be gained. When used by subcutaneous injection, the dose of extract should be carefully mixed with ten or fifteen minims of water. This mixture has always an acid reaction, which is sometimes so decided as to produce slight irritation of the cellular tissue; but this can be avoided by carefully neutralizing the mixture with a solution of carbonate of soda. Suppositories, made with oil of theobroma and white wax, may be employed when administration by the anus is desired. Each of these should contain two grains of extract. For children, we must be guided by the general rule of employing, according to age, one-third or one-fourth, or even less, of the above doses. It will be found necessary to repeat these doses frequently—every hour, every hour-and-a-half, or every two or three hours—and, of course, the severity of the disease and the effect of the remedy will be the best indications for this. The great object is to produce as quickly as possible, and then to maintain, the physiological effect of physostigma in diminishing reflex excitability. The doses must, therefore, be continued in increasing quantities until this physiological effect is produced, or until the sedative action of the drug on the circulation is carried to a dangerous extreme, or until constant nausea and vomiting compel us to desist.

This nausea is, I believe, due to the action of physostigma in causing energetic contractions of the stomach and intestines. To this cause may also be referred a peculiar epigastric sensation, which is one of the first symptoms of the action of this drug, whether it be administered by the stomach or subcutaneously, and which is always relieved by eructation. The catharsis that physostigma causes—probably an advantageous effect in tetanus—is another result of this intestinal contraction, though it is also due to an increase of secretion by the intestinal glands.

Another physiological effect of physostigma is excessive perspiration. This is most strikingly observed when a large dose is administered by subcutaneous injection. It may be of some importance in the treatment of tetanus, for sudorifics are vaunted as reliable remedies for this disease; but, as I am at a loss to understand why perspiration should in itself prove beneficial, I mention it only as an indication that physostigma is affecting the system.

It might reasonably be expected that the active principle of physostigma—eseria—should be valuable in tetanus, and especially for administration by subcutaneous injection. It is, however, an alkaloid that is very difficult to prepare, and, as far as my knowledge of its properties is concerned, it appears to be somewhat unstable. There is, besides, but little advantage in employing a more active remedy than the extract of physostigma.

In these observations, no distinction has been drawn between the traumatic and idiopathic varieties of tetanus. As far as treatment is concerned, they only differ in this, that the traumatic variety is usually the more severe and acute, and that it, therefore, generally demands a very energetic and active employment of the remedy.

I have avoided all discussion of subsidiary measures, as these are not included in the subject of the present communication.

Chorea.—As the principal indications for the therapeutic use of physostigma have been already mentioned, its employment in chorea may be very briefly considered. Dr. George Harley was, I believe, the first to use physostigma in this disease. His case occurred at the end of 1863, and was a successful one. Since then, three successful cases have been published by Dr. John Ogle; and I have seen others in which successful results were attributable, in great measure, to the use of this drug.

The disease is one of such protean form, that it is impossible to advise the use of one remedy for all cases. It must, however, be admitted that in the great majority of cases involuntary contractions occur of such a character as to demonstrate an exaggerated condition of the reflex motor function of the cord. The want of co-ordination in the movements by which this disease is characterised, is dependent, not only on imperfect voluntary contractions, but also—and sometimes in great degree—on involuntary contractions. The latter are obviously the results of either a stimulus supplied by the exercise of volition, or of one supplied by the voluntary movements themselves, acting through afferent nerves on an abnormally excitable condition of the reflex centres. We have seen that the action of physostigma is to diminish such a condition.

The treatment of this disease will rarely require to be so active or energetic as that recommended for tetanus. Physostigma should be administered either in the form of powder or of tincture. From three to six grains of powder, thrice or four times daily, may be given to children, and from ten to twenty grains, as frequently, to adults. The Pharmacopœia does not contain a tincture, but a formula for an efficient and sufficiently active one has been published. It may be given to children in doses of from five to fifteen minims, and to adults of from twenty to thirty minims.

However promising the treatment of chorea by physostigma may appear, the experience we yet possess is much too limited to allow us to arrive at any decided opinion as to its value.—*Practitioner, Aug.* 1868, *p.* 76.

19.—A CASE OF ACUTE TRAUMATIC TETANUS TREATED SUCCESSFULLY WITH EXTRACT OF CALABAR BEAN.

Under the care of Mr. Ashdown, at the Northampton General Infirmary.

[The patient, 33 years of age, was a labourer, who had received a wound half an inch in length on the scalp and a second on the left ear from a fall off a coal-stack. A fortnight after this the first symptoms of tetanus appeared.]

On admission (October 3rd), the tetanic aspect was strongly marked. The forehead was permanently wrinkled, and the angles of the mouth retracted. The teeth could be separated about half an inch. The respiration was quick, and chiefly thoracic; the abdominal muscles were tense and unyielding to pressure; the back was arched, and its muscles rigid; as also were those of the legs, the arms alone being freely moveable. The skin was bathed in perspiration; and the chief complaint was in pain at the pit of the stomach. There was a slight appearance of suppuration about the wound on the left ear, but that on the scalp cicatrised. The urine was retained. Pulse 114. He was ordered to take one-sixth of a grain of extract of Calabar bean in a drachm of water every half-hour; and to have strong beef-tea, milk, eight ounces of port wine, and four ounces of brandy.

In the evening, the pulse had fallen to 94; but the paroxysms came on every few minutes, and were produced immediately by any disturbance. He had been fed by means of a piece of gutta-percha tubing passed to the back of the tongue and attached to an ordinary feeder, and seemed to have no difficulty in swallowing. His urine was removed by a catheter.

On the 4th, the patient's condition was but little altered, though the pain was not quite so severe, and at times he had been able to move his legs slightly.

On the 5th, after a visit from his friends, he was much worse; violent paroxysms coming on every few minutes, and the muscles appearing even more rigid than previously. The pupils were rather dilated, and freely influenced by light. The dose of the extract was increased to one-third of a grain, and the wine and brandy doubled in amount.

October 6th. He had vomited several times, and was not in the least improved. The medicine was stopped, and one-third of a grain of extract of Calabar bean, dissolved in eighteen minims of water, ordered to be injected every two hours under the skin. The effect of the first subcutaneous injection was very marked. In about five minutes, the legs, which had been previously perfectly rigid and immoveable, became flaccid and freely moveable by the patient; the abdominal muscles became less tense; and the arching of the spine disappeared. The pupils also contracted, and the pulse sank to 82. The effects lasted between two and three hours, and all the symptoms then reappeared. Beef-tea and brandy enemata were ordered to be used every four hours.

October 7th. The vomiting had been less frequent, but had not entirely ceased. Every subcutaneous injection, which had been given regularly every three hours during the night, had been followed by an almost complete remission of the symptoms, lasting for about two hours. In the evening, each dose was increased to half a grain.

October 8th. He passed a restless night, though he had not been in so much pain, and had for the first time been able to dispense with the aid of the catheter. Vomiting had ceased; and several eggs had been taken, beaten up with wine. The beef-tea and brandy enemata were therefore omitted. Eggs *ad libitum*, and a bottle of sherry daily, were ordered. The dose of extract of Calabar bean was increased to three-fourths of a grain in each injection, to be given at intervals of two hours only, or as soon as the effect of the previous injection had passed off.

October 9th. The injections had been continued every two hours, and their influence in preventing the muscular rigidity and spasms remained unabated; the only muscles not perfectly relaxed were those of the abdomen and back. The pupils were much contracted, and the patient had been at times very delirious. He continued to take plenty of nourishment. The urine contained a large quantity of phosphates. As the injections occasioned much pain and inflammation in the cellular tissue, and the solution was found to be acid, a few drops of liquor potassæ were added to it. The solution thus obtained was more perfect, and produced less pain.

October 10th. During the night, as the patient was very delirious, and the pulse had risen to 148—effects supposed to depend on an over-dose of the medicine—the injections were stopped for seven hours. This morning the muscles were as rigid as ever; and the paroxysms, which had almost ceased, again increased in frequency. The injection was ordered to be continued as before. In the evening, the pulse had fallen to 125; but the injections had been required every two hours, the effect not lasting so long as previously

October 11th. The dose was increased to one grain at similar intervals.

October 12th. One-third of a grain of morphia was ordered to be injected subcutaneously every night with that of Calabar bean; as the latter, notwithstanding its influence in subduing the spasms and rigidity of the muscles, did not secure sleep, and the night had been restless and disturbed.

October 13th. He slept well all night after the morphia injection was given; and this morning there was a marked improvement. The pulse 94; the countenance flaccid, and not expressive of suffering; the muscular rigidity less; and paroxysms infrequent. He took twelve eggs and two bottles of sherry in twenty-four hours.

October 15th. As the skin was becoming tender from the numerous injections, and the severity of the disease was evidently subsiding, they were omitted, and suppositories containing a grain and a quarter of extract of Calabar bean were ordered to be applied every two hours; the morphia to be continued every night.

From this time, the patient gradually improved, the suppositories acting very favourably; but it was not until November 1st that all the rigidity of the muscles had finally and permanently disappeared, and convalescence was established. Up to this time, the suppositories had been continued, though at gradually increasing intervals. A few small subcutaneous abscesses formed at the sites of some of the injections, but they gave little trouble; and he was discharged well on November 30th.

Remarks.—The result of this case—which, though not, perhaps, of the acutest type, was one of very great severity—shows that the plan of treatment adopted is deserving of a more extended trial; for, though the Calabar bean does not appear to exercise any direct curative action in the sense of cutting short the disease, it is impossible to doubt its influence in controlling the more urgent and dangerous symptoms. The superior advantages of the hypodermic method of administering the extract of Calabar bean were in this case very obvious; for in this way relaxation of the spasmodically contracted muscles was very rapidly and invariably produced, even when the dose was extremely small; while, when administered by the mouth, only a large dose exercised any obvious influence, and its further continuance was contraindicated by the sickness caused by it. It was noted that the extract of Calabar bean, when rubbed up with water, formed a very acid solution; and that the addition of a few drops of liquor potassæ, without interfering with its efficiency, produced a more perfect solution, and one not producing pain at the time of injection, or inflammation in the cellular tissue subsequently.—*British Med. Journal, March* 21, 1868, *p.* 274.

20.—ON THE PATHOLOGY AND TREATMENT OF EPILEPSY.

By Dr. GEORGE JOHNSON, Physician to King's College Hospital.

To what extent do the phenomena of an epileptic fit admit of explanation? In a fully developed epileptic fit, there are two chief phenomena to be explained: these are loss of consciousness and convulsions. The loss of consciousness, until within a very recent period, has generally been supposed to be a result of congestion of the nervous centres, and especially of the cerebrum. But this explanation is inconsistent with the fact, that the epileptic loss of consciousness comes on in a moment at the very commencement of the attack, when there is no evidence of congestion, and when the face is usually pale from anæmia. The congestion follows the loss of consciousness; and the explanation of its occurrence appears to be this. The convulsion implicates the respiratory muscles; the blood, therefore, being imperfectly aërated, is impeded in its passage through the lungs; it consequently accumulates in the right side of the heart and in the veins. The congestion, therefore, is a secondary venous congestion; and, at the time when this congestion has reached its greatest height, there is often a commencing return of consciousness. Obviously, then, this congestion is not the cause of epileptic loss of consciousness. This retrograde venous engorgement is the cause of the ecchymoses beneath the skin and the conjunctiva, which often occur during a fit, and of the hemorrhage into the substance or upon the surface of the brain, which happily is a much less frequent accident.

A number of facts point to the conclusion, *that both the loss of consciousness and the convulsions of epilepsy are the result of sudden and extreme anœmia of the brain.*

In man, and in most, if not in all, warm-blooded animals, a rapid and very copious hemorrhage usually causes convulsions. Kussmaul and Tenner state (*On Epileptic Convulsions from Hemorrhage*, New Sydenham Society, 1859) that, in numerous cases of dogs, cats, and rabbits, they observed, without a single exception, violent and general convulsions preceding death from loss of blood. In order to produce this result, the hemorrhage must be rapid. If it occurs slowly, so that the vital powers are gradually consumed, death then occurs with swooning, drowsiness, and delirium, without convulsions.

The same observers found that an interruption in the supply of blood to the head of a rabbit, by ligature or compression of the arteries, produces epileptic fits as surely as hemorrhage does. In about one hundred rabbits, they ligatured or compressed the carotids and subclavians, from which, be it remembered, the vertebrals proceed, and in every instance except that of one very old, lean, and feeble rabbit, convulsions occurred. In order to produce convulsions, it was necessary to close all the four arteries which supply the brain. If but one carotid or one subclavian remained pervious, the animal was enfeebled and more or less paralysed, but not convulsed. And again, if during the height of a convulsion, the ligature is removed from one carotid, the convulsions generally cease immediately, and there is a sudden change from the most frightful spasm to complete relaxation of the muscles. The description of the convulsions thus artificially produced in these animals, shows that they were essentially the same as epileptic convulsions in the human subject. There was the dilated pupil, the tonic spasm, quickly succeeded by clonic convulsion, so violent as to throw the animal forcibly forwards to a distance of one or two feet, and sometimes even over the shoulders of the experimenter. These experiments suffice to show the fallacy of the explanation which Dr. Brown Séquard and others have given of the clonic convulsions in man. It has been supposed that the clonic convulsions are a consequence of the circulation of black blood which results from the tonic spasm of the respiratory muscles. Now it is manifest that, in these animals with ligatured arteries, no black blood could reach their brain. In them therefore, the clonic convulsion, as well as the preceding tonic spasm, must be due to want of blood, and not to the altered quality of blood in the brain.

These experiments obviously cannot be repeated on the human subject; but Drs. Kussmaul and Tenner describe the effects of compressing the carotids in six men. In all, the face turned pale; the pupils first contracted and then dilated; the respiration became slow, deep, and sighing; then there was giddiness, staggering, and unconsciousness, and the patients would have fallen had they not been supported. "In two subjects, of weak intellect and moderately anæmic, in whom, notwithstanding the above symptoms, the compression was continued, a choking sensation, attended by vomiting and general convulsions, came on, which, however, did not attain an aggravated form; for, on withholding the compression, they disappeared in a few seconds." (*Op. cit.* p. 28.)

Compressing the carotids does not, of course, entirely cut off the supply of arterial blood to the brain; but these experiments render it probable that sudden occlusion of all the arteries of the head will as certainly excite epileptic convulsions in man as in the lower animals.

There is a class of cases in which a sudden arrest of the blood in its passage through the lungs causes convulsions and speedy death. I mean cases in which the circulation is arrested by the admission of atmospheric air into the veins—cases of embolism of the pulmonary artery; again, cases in which the flow of blood through the lungs is stopped by the injection of certain salts into the veins; and, lastly, cases of acute apnœa. When animals are killed by blowing air into the veins, the breathing becomes hurried, the animal falls down, and usually dies in convulsions; the contents of the bladder and rectum being frequently expelled at the time of death. Dr. John Reid states that, "in a very few cases only, is death from this cause not preceded by convulsions." (*Physiological, Anatomical, and Pathological Researches.*) The immediate cause of death in these cases is the arrest of the frothy mixture of air and blood in its passage through the minute pulmonary arteries (the air rarely reaches the left side of the heart); and, as a result of this arrest, there is, of course, anæmia of the brain and of every other organ supplied by the systemic arteries.

In man, it appears that death from the admission of atmospheric air into the veins has been less frequently preceded by convulsions. Probably the chief reason of the less frequent occurrence of convulsions in the human subject is, that the amount of air accidentally admitted is less, and death, consequently, is less rapid than when air is forcibly driven into the veins of an animal. It would probably be found on a careful inquiry, that the occurrence of convulsions in these cases depends upon the circulation being suddenly and completely arrested.

Convulsions are mentioned in only five out of fifteen cases collected by Amussat; but, Dr. Reid remarks, "several of the cases, as we might have expected, are very imperfectly reported; for it is not to be supposed that the surgeon or his assistants should possess the coolness and time to watch narrowly the phenomena, when their minds were agitated by the threatened sudden dissolution of their patient, and their attention distracted by anxious attempts to save him." For the same reason, the record of cases of pulmonary embolism is very imperfect; but, in some instances, it has been observed that death was preceded by violent convulsions; and Virchow noted, amongst the results of artificial embolism of the pulmonary artery in animals, convulsions and dilatation of the pupil. (*Des Emboles Pulmonaires.* Par B. Ball, p. 129.)

Again, Blake found that an injection of a solution of soda or its salts into the veins of a dog, destroys life by arresting the flow of blood through the lungs. The left side of the heart is found empty, and the right distended. Death occurs in about forty-five seconds, and is preceded by violent opisthotonos. (*Edinburgh Medical and Surgical Journal*, vol. liv, p. 343.)

Blake attributes the nervous symptoms to the venous pressure on the brain; but they may, with much more reason, be attributed to the arrest of the arterial supply to the brain. When, from any cause, the blood is arrested in its passage through the lungs, it is obvious that distension of the systemic veins must have, as its necessary correlative, comparative emptiness of the systemic arteries; the one will be an index and a measure of the other.

Lastly, we have the convulsions which occur in almost every case of acute apnœa or sudden suffocation. It is generally supposed that the convulsions of apnœa are excited by the circulation of black blood through the brain; but they are more probably due to the rapid and extreme anæmia of the brain consequent upon the impeded transit of blood through the lungs. When the air is excluded from the lungs, the circulation is rapidly arrested by the contraction of the minute pulmonary arteries. That this is the true explanation of the convulsions of apnœa, is rendered highly probable by an observation of Kussmaul and Tenner (*op. cit.* p. 75), to the effect that "the approach of convulsions in strangulation can be accelerated if the arteries are simultaneously compressed." It is obvious that, if the presence of black blood in the brain were the cause of the convulsions, their approach would be retarded, and not accelerated, by compression of the arteries which supply the brain. The facts are consistent only with the theory that the immediate cause of the convulsions in cases of suffocation is a rapidly increasing cerebral anæmia, resulting from the arrest of the pulmonary circulation. Black blood, in so far as it is deficient in oxygen, is equivalent to no blood. Probably it is rather by its negative quality of being unoxygenised, than by any positively noxious properties, that it is unsuited to maintain the functions of the brain. It is probable, too, that the minute cerebral arteries resist the passage of black blood, and so increase the anæmia of the brain. If the circulation of dark blood through the cerebral vessels would excite convulsions, we should expect to find this symptom of common occurrence in cases of emphysema with bronchitis.

I have now referred to instances of epileptiform convulsions occurring under a considerable variety of circumstances, but all agreeing in this one condition, namely, that the convulsions are associated with a defective supply of arterial blood to the brain. Let us now proceed to inquire whether the phenomena of epileptic convulsions, as they ordinarily occur in the human subject, are consistent with the theory of anæmia. It is a matter of general observation that, at the very commencement of an epileptic fit, the face is pallid. There is anæmia of the superficial vessels; and with this there is probably associated anæmia of the intracranial vessels which supply the brain itself. The pallor is in most cases soon succeeded by lividity, owing to venous engorgement consequent upon the impeded respiration and pulmonary circulation. It is very remarkable that, while the face is pallid, the heart and the carotids are beating strongly. It is probable, therefore, that there exists some impediment to the flow of blood through the minute branches of the arteries. To explain this impediment, Kussmaul and Tenner suggest that the minute arteries, both the superficial and the intracranial branches, contract so as to bar the passage of blood. Hence arise the pallor of the face and the epileptic convulsion. In some cases, it is said that the face is more or less livid at the very commencement of the fit. The probable explanation of this is, that the respiratory muscles are convulsed, and there is a consequent venous turgescence before the spasm affects the facial arteries. The spasm of the *facial* arteries, though usually present, is obviously not the cause of the fit. The early implication of the respiratory muscles is clearly shown in those cases in which the "epileptic cry"—a result of spasm of the glottis—is the first indication of the fit.

Kussmaul and Tenner endeavoured to support the theory of arterial spasm by experiment, and to some extent they succeeded. In each of three white rabbits they ligatured the two subclavians and one carotid; the cervical sympathetic was then exposed and galvanised, with a view to excite contraction of the arteries by the stimulus conveyed through the vaso-motor nerves. In two animals, no effect was produced; but in the third rabbit the background of the eye became completely pale; the pupil dilated, so that that the iris could scarcely be seen; the neck was drawn back; and violent convulsions occurred. The electrodes being removed, the spasm ceased, the pupil contracted, and the background of the eye became red; but the animal continued in a swooning condition. After some minutes, electricity applied to the sympathetic nerve produced the same effects as at first. A third attempt did not succeed.

The authors suggest that these experiments deserve repetition, with the view of rendering certain what at present is probable;

namely, "epileptic convulsions can be brought about by contraction of the bloodvessels induced by the vaso-motor nerves."

According to this theory, then, epilepsy is a result of sudden anæmia of the brain; and this anæmia, when not caused by hemorrhage or by a mechanical impediment to the circulation outside the cranium, is due to an extreme contraction of the minute cerebral arteries. With reference to this theory of arterial contraction, all cases of epilepsy may be arranged in in two distinct classes: 1, cases in which the arterial contraction is the result of a purely nervous or reflex influence; 2, cases in which the arterial spasm is a result of blood-poisoning.

In the first class are included all cases of epilepsy which are due to emotional influence, sudden terror, or anger, or long continued anxiety and sorrow, perpetuated and intensified often by nocturnal dreams and frequently recurring nightmare; also cases associated with those disordered states of the nervous system which are the result of vicious sensual habits; cases, too, in which the disease is hereditary. This class also includes cases of epileptic convulsions from the irritation of the gums during dentition; of the kidney, or the ureter, or the gall-duct, by a calculus; and of the alimentary canal by worms. Again, the cases in which convulsions result from tumours or other organic disease of the brain are included under the head of epilepsy from a reflex influence. The structural change in the brain is not the proximate cause of the epilepsy; it excites the epileptic convulsions through a secondary reflex influence upon the blood-vessels. Dr. Brown Séquard's guinea-pigs, rendered epileptic by injury to the spinal cord, are also included in this class of cases. The injury to the cord probably acts by increasing the reflex excitability of the nervous centres, so that a trifling external irritation suffices to excite a fit.

In the class of toxæmic epilepsy are included those cases in which noxious materials in the blood are the immediate exciting cause of the arterial spasm—uræmic convulsions, and all cases of convulsions from retained excreta; convulsions resulting from the admission into the circulating blood of unwholesome and undigested food; the convulsions which result from alcoholism; the convulsions which sometimes occur during the initiatory stage of certain of the acute febrile exanthemata, more especially small-pox; the convulsions which are occasionally associated with pyæmic infection; and the convulsions resulting from a poisonous dose of prussic acid. In each and all of these cases, it is probable that the immediate cause of the convulsion is anæmia of the brain, resulting from contraction of the cerebral arteries; the arterial spasm being excited by the presence of morbid blood in the vessels.

In the hypertrophy of the muscular walls of the arteries of the pia mater, which we have recently observed in cases of Bright's disease, we have evidence of a continual resistance to the passage of the deteriorated blood through these vessels. This resistance probably explains some of the cerebral symptoms of Bright's disease; but a convulsive seizure must be due to a sudden temporary increase of arterial contraction—this sudden contraction differing as much from the continuous tonic contraction of the vessels, as the cardiac spasm of angina pectoris differs from the regular strong contractions of a hypertrophied ventricle. With reference to the action of prussic acid upon the blood-vessels, it is noteworthy that Blake, having killed a dog by injecting prussic acid into the jugular vein, observed that, after the animal had ceased to struggle, the dynamometer in the femoral artery still indicated a considerable increase of pressure. This fact is explicable only on the supposition that the prussic acid excited unusual contractions in the minute systemic arteries; and this contraction of the cerebral arteries would account for the convulsions in cases of prussic-acid poisoning. Again, the symptoms which result from an over-medicinal dose of prussic acid are such as might be occasioned by a less degree of obstruction to the cerebral circulation. These symptoms, as described by Pereira, are the following: "disordered and laborious respiration (sometimes quick, at others slow and deep), pain in the head, giddiness, obscured vision, and sleepiness. In some instances, faintness is experienced." These symptoms are remarkably like those of the epileptic vertigo, or *petit mal*, as it is called; and, like them, they are probably due to a temporary and partial interruption of the cerebral circulation by arterial spasm. The poison, being very volatile, is quickly exhaled by the lungs; and the symptoms soon cease. In accordance, then, with this theory of arterial contraction, epilepsy might be designated *cerebral collapse;* and, on the other hand, the arrest of the circulation by the contraction of the pulmonary arteries in the collapse of cholera may be looked upon as a form of *pulmonary epilepsy.* Without doubt, the true key to the pathology of both these awful diseases, epilepsy and cholera, is to be found in this doctrine of arterial spasm.

The two classes of epileptic cases—the purely nervous and the toxæmic—have their analogues in the two varieties of laryngeal spasm. Spasm of the larynx may result from irritation of the brain, or of the gums, or of the alimentary canal; in short, it may be a purely nervous reflex *laryngismus stridulus*, which is closely allied to epilepsy. On the other hand, laryngeal spasm may be excited by a crumb of bread or a grain of salt, or other irritant, within the larynx; and this is analogous to the arterial spasm which is excited by toxæmia, and which may result in an epileptic fit.

There are various forms of what may be called partial epilepsy: sudden and transient impairment of motor power, or irregular spasmodic movements limited to a particular set of muscles various disordered sensations in limited portions of the skin; derangements of the special senses; sudden perversion of taste, or smell, or sight, or hearing; sudden impairment of speech; vertigo; confusion of thought; temporary delirium; and mental excitement. One or more of these symptoms may occur singly or variously combined in different cases, the onset and the departure being often equally sudden. In explanation of these phenomena, Dr. Hughlings Jackson has, with much ingenuity, suggested that they may result from a sudden temporary interruption of the blood-current through one or more branches of the cerebral arteries by spasm of their muscular walls; so that the brain-tissue within a circumscribed "arterial region", having its nutritive supply arrested or limited, would suffer a suspension or impairment of its proper functions. This appears to be a very probable explanation of the curious phenomena in question. It must be borne in mind, that the brain is not one organ, having a simple function, like a lung or a kidney; but that it is a congeries of complex organs, having very diverse functions. It seems probable that the physiological co-operation of all these cerebral organs may require that the blood-supply to the various regions of the brain should be specially regulated by certain branches of the arterial tree, under the guidance of the vaso-motor nerves; and this regulating power residing in the arteries probably renders them liable to disorderly action under the disturbing influences of disease.

It is not now my intention to enter into details as to the treatment of epilepsy; but there are two remedies upon which I desire to say a few words; namely, chloroform and bromide of potassium. It is a well-known fact that chloroform inhalation has a remarkable power of arresting epileptic convulsions. Its action in warding off a threatened fit, and in cutting short a violent and prolonged paroxysm, is uniform and certain; as uniform and as certain as the influence of sudden and extreme anæmia in exciting convulsions. I for a time supposed that the chloroform acts by relaxing the cerebral arteries; Kussmaul and Tenner have shown that animals, when etherised, get no convulsions while being rapidly bled to death, or when their arteries are ligatured. It is probable, therefore, that anæsthetic vapours prevent or stop convulsions by lessening the reflex excitability of the nervous system, so that convulsions do not occur in etherised rabbits, even though the brain be rendered extremely anæmic by hemorrhage or by arterial obstruction.

Recent experience has amply proved that the bromide of potassium, in full and frequent doses and sufficiently long continued, is of great value in the treatment of epilepsy. The known physiological action of this medicine renders it probable that its curative effect in epilepsy is a result of its soothing, sedative, anæsthetic influence upon the nervous centres, whose reflex excitability it lessens. In short, its action in preventing convulsions is analogous to that of chloroform, differing in being less powerful and rapid in its operation, yet, by frequent repetition, its influence may be rendered more durable and more permanently beneficial.—*Brit. Medical Journal, March* 21, 1868, *p.* 265.

21.—ON ERGOT OF RYE IN THE TREATMENT OF NEURALGIA.

By Dr. Edward Woakes, Luton.

[Dr. Woakes published a paper last year on the correlation of neuralgia to skin-rash. It is possible that the consideration of some of the typical forms of this association of symptoms may throw some light on the more obscure forms of neuralgia.]

One inference arrived at was, that the rash, when present in neurotic disease, can be accounted for only by a reference to the structural anatomy of the parts involved in the lesion; while the uncertain fact of its occurrence was inferred to depend upon the nature and intensity of the exciting cause of the attack. In other words, the rash was looked upon as complementary of the pain, but having this important distinction, that, being a tangible symptom, whose causation could be traced, it suggested a clue whereby to unravel its more obscure and more formidable congener, the pain.

In order to make these remarks intelligible, I will, with your permission, briefly recapitulate so much of the theory as is necessary to show the connection between it and the treatment now proposed, which results as a direct corollary from it.

A comparison of the neuralgic and eruptive phenomena which occur when the nerve is wounded, with the corresponding symptoms exhibited in purely idiopathic cases of nerve-lesion, showed so close an approximation as to permit of their being regarded, for all practical purposes, as identical. The theory developed from this parallelism of symptoms was this:—The results being similar in both the traumatic and idiopathic classes, the causation in each group of cases, though differing in respect of intensity, operates through the same anatomical channels, and induces the same physiological phenomena in both.

In the traumatic instances, the symptoms were shown to be manifestly due to the paralysing influence of the injury or shock upon the fibres of the sympathetic system of nerves accompanying the *arteries* in their distribution to the *skin* and to the *sentient nerves;* and the resulting symptoms were found to be in accordance with the physiological sequence of such palsy.

In the other instances, that of idiopathic neuralgia associated with skin-rash, of which shingles may be taken as a type, the same theory of shock inducing palsy of the sympathetic fibres supplying the affected tissues was cited to explain the attendant phenomena. The sympathetic nerve-fibres accompanying, say, an intercostal artery, are lost *in the direction of the skin*, on the minute divisions of the artery supplying its ultimate structure. When these nerve-fibres are paralysed from any cause, their function of regulating the calibre of the vessels will be withdrawn. Passive congestion of these vessels, and consequent effusion of liquor sanguinis, are the physiological consequences of this nerve palsy. Tracing such an effusion in a cuticular papilla, there will be found, in the first place, a corresponding elevation of the cuticle covering it, which gradually gains the character of a true vesicle as the effusion increases, until in this manner a spot of herpes is produced. Following out the track of this anatomical clue, we are led to an explanation of the *pain*—the neuralgia—so often associated with shingles. The same artery which supplies the affected spot of skin, sends also nutrient vessels to the neighbouring sentient nerves, which vasi nervorum are furnished with regulating sympathetic fibres continuous with those proceeding to the cutaneous arterial twigs. These vasi nervorum will, therefore, acknowledge the same impressions, and manifest the same behaviour under them, as do the minute vessels of the skin when under the influence of shock, as just now described. Consequently, there will ensue, synchronously with the corresponding skin-phenomena, a state of dilatation of these vessels, and exudation from them of watery elements between the fibrillæ of the nerve; and, being confined in this locality by the fibrous sheath of the nerve, a mechanical stretching and compression of its constituent sensory fibres ensue, resulting, as might be expected, in the acute pain so characteristic of neuralgia.

It will be impossible here to repeat the entire argument on which these conclusions are based, and I must content myself by referring any one interested in the matter to the paper from which I have quoted. That shock of the kind alluded to is the proximate cause of shingles, is borne out by many examples, but by none more strikingly than one which recently came to my knowledge. A single young woman, aged about twenty, wore through one day, and at the cost of much suffering, a pair of stays considerably too small for her. In the course of three or four days, an attack of shingles supervened. Of course, it is not implied that the shock does in all cases assume the palpable form just mentioned; draughts of cold air, and other more subtle influences, being frequently the starting-point in the disease. The application of this theory is, *mutatis mutandis*, coextensive with the wide range of neuralgic affections; and its soundness may be tested by its capability, in the first place, of suggesting an explanation of successful though purely empirical modes of treatment, and, in the second place, of originating new and more precise methods of cure.

In treating the pain remaining after a simple case of shingles, therefore—and the remark applies to all uncomplicated forms of neuralgia—the chief indication is to restore the tone of the vessels, withdrawn through the paralysing influence of the shock on the nerves controlling them. In other words, we have to induce in the sympathetic fibres concerned a return to their normal function of regulating the circulation through the small arteries and capillaries. This equlibrium being once restored, we may confidently expect the disappearance of the effused fluid from its disturbing situation amongst the fibrillæ of the sentient nerves.

The drugs hitherto found useful in the simple forms of neuralgia, the pathology of which I have so inadequately attempted to indicate, may, I believe, have their *modus operandi* traced to their influence upon the sympathetic nerves, through the medium of which they restore the suspended tone of the remote arterial circulation. To the list of these, foremost amongst which is belladonna, I would now suggest that there should be added the *ergot of rye*—basing the recommendation upon the experience of the following cases.

My attention was first drawn to this drug, as of probable use in nervo-therapeutics, from observing its power of controlling the hemorrhage in a case of hæmoptysis—showing that the range of its operations on the vascular system is by no means limited to that part of it represented by the uterine vessels. It seemed equally clear that its effect in this respect was mediated by the ganglionic nerves; and, therefore, that it was exactly adapted for exerting a remedial effect over the pathological condition of neuralgia depicted in my theory. Examples might have been added where great benefit accrued from a combination of the ergot with other remedies adapted to the case; but those only are reported where the drug was administered *per se*.

Case 1.—*Shingles.*—M. M., a single female, aged 22, of sallow complexion. The catamenia had been absent six months. She had had headache six weeks; and sharp pain in the right side of the chest one week, after which an herpetic rash appeared beneath the right breast, extending backwards on this side to the spine. At this time (February 10th 1868), there was also a sharp neuralgic pain (besides that below the breast) in the second right intercostal space. The bowels were confined. I ordered her an ounce of mistura alba three times a day. On February 12th, she was no better. The rash was extending on the same side. The pain was very severe under the right breast. Her person exhaled a peculiar pungent odour. On February 15th, she was in about the same condition, and was ordered to take fifteen minims of liquid extract of ergot in an ounce of water every four hours. On February 17th, she stated that the pain was very much better since taking the medicine. She passed a great deal of urine. On February 19th, the pain in the side was worse. The ergot was increased to forty minims. On February 21st, she had been almost free from pain since the last date. She said her sight was very dim. The pupils were dilated. She was ordered to discontinue the ergot, and take twenty minims of solution of sesquichloride of iron in water three times a day. On February 24th, the catamenia returned. The odour was gone. She felt quite well, and had no pain. On February 29th, she experienced a slight relapse of pain, with great weakness. She was ordered to discontinue the steel, and to return to the ergot, a very few twenty minim doses of which completely cured her.

Remarks.—This instructive case points throughout to some lesion of the nervous system as the root of the malady. The pungent sweats are specially interesting, as they occur in some cases of wounded nerves, as pointed out in the report of cases of this kind from America. I believe the steel was prejudicial; and infer that, in many cases of simple suspended menstruation (chlorosis) in young females, ergot of rye is a preferable remedy.

Case 2.—Sciatica.—E. L., aged twenty-one, had pain in the left hip, shooting down the back of the leg in the course of the sciatic nerve, worse at night, with thick high-coloured urine, during four months. The catamenia were regular. This, being regarded as a case of rheumatic sciatica, was treated for a week with alkalies and iodide of potassium; but, as the pain became worse, she was given, on March 3rd, 1868, ten minims of extract of ergot in an ounce of water every four hours. On the 4th, she stated that she slept much better; and the pain was much relieved since the previous day. On the 7th, she had had no return of pain since the 4th. She said she had not been so well for four months. Her remaining debility was met by a combination of ten minims of liquor ferri sesquichloridi and six minims of liquid extract, of ergot, in water.

Remarks.—It will be observed that this patient was cured completely in four days of an illness which had caused her increasing annoyance during four months. The case illustrates also a point supported by subsequent experience; viz, that, when ergot is likely to be useful, its good effects commence immediately.

Case 3.—*Tic Douloureux.*—Emma B., aged twenty-one, was attacked on April 27th, 1868, with very severe tic of the left side of the face, affecting especially the inferior dental nerve, and extending downwards to the shoulder. She had some dyspepsia, but otherwise was healthy. She was ordered to take an ounce of the following every four hours.

℞. Potassæ bicarbon. ʒiss; infusi ergotæ ℥vi; extract. ergot. liquid. ʒi. M.

On April 29th, the tic was almost gone She complained now only of weakness. At her next visit, recovery was complete.

Case 4.—*Hemicrania.*—John Gray, aged about thirty-five, has been repeatedly under treatment for that form of neuralgia known as brow-ague. His attacks have been cured alike by quinine and sesquioxide of iron. Sometimes they are very severe, and the treatment long continued. He was last seen in May 1868, when he had a very sharp attack of neuralgia of the right temple. He was ordered to take, every four hours, an ounce of a mixture of two drachms of liquid extract of ergot in six ounces of infusion of ergot. After taking this for two or three days, he was cured more satisfactorily and quickly than in his former attacks.

Case 5.—*Tic Douloureux.*—Miss E., aged twenty-two, was seen on June 2nd, 1868. She had had tic in her left temple for two weeks, very severe at times. The tongue was foul, the secretions normal, and the general health good. A stomachic with soda and rhubarb was prescribed. On June 4th, the tongue was cleaner; but the neuralgia was unrelieved. She was ordered to take, every four hours, an ounce of a mixture containing two drachms and a half of liquid extract of ergot in eight ounces of infusion of ergot. The neuralgia was relieved immediately after commencing this treatment, and entirely left her after using it two or three days.

In one case of chronic, and one of acute sciatica, the ergot failed to relieve; but it is hoped that the very favourable result which the examples now reported indicate to have accrued from its use may gain for the drug a more extended trial in neurotic affections; and that, shortly, sufficient data may be collected to enable one to decide with some degree of precision the class of cases in which to expect from it the marked benefit it is evidently capable of effecting in many forms of the disease.—*British Medical Journal, Oct.* 3, 1868, *p.* 360.

22.—ON THE ACTION OF ACONITE AND QUININE IN NEURALGIA.

By Dr. H. M. Jones, Physician Cork City Dispensary, Demonstrator of Anatomy at the Queen's College, Cork.

[In cases where the writer has used aconite he has always combined it with quinine. The cases most suitable for this treatment are facial neuralgia and cephalalgia.]

Having often seen the good results from the combination of these two powerful drugs, I determined to use them as a first means on this particular instance, and then thought that it might be a good example to add to the list of those brought before the profession of the use of aconite.

Mrs. H., aged 72, apparently very strong and robust, I saw on January 16th, 1867, about six p.m., suffering the most excruciating torture, quite unable to speak coherently and shrieking dreadfully from pain. Her daughter explained to me that this had come on violently since three p.m. of the same day, but that for a few days previously, she had suffered slight neuralgic attacks in the arm and side. The old lady writhing in agony directed my attention to her thumb, and from her daughter I learned the following history :—Twenty-five years previously she had injured her hand ; the bones of the thumb got affected, and Sir P. Crampton wished to take away a piece of one. This she would not consent to, and five years subsequently, during a period of extreme cold and frost, she got a bad attack of neuralgia, and went to her physician, requesting him to amputate the thumb, so bad was the pain in it.

Though shaken greatly in her general health, she had no return of neuralgia for a period of twenty years, until the severe frost of January of this year again brought it on. I was on the point of examining the thumb, but the moment I touched it, she screamed most violently, and got into such a state, that it completely prevented any further examination, and I refrained, satisfied that she suffered from pure nervine pain propagated by the old lesion in the thumb, and fostered by the extreme cold—she having gone out each day to chapel notwithstanding her daughter's entreaties. My visit was hurried, as I saw that her suffering was so intense, and all she could now say was that if I knew of no other means to alleviate the pain, to get the thumb amputated forthwith.

I ordered immediately—Tinct. aconiti, ʒi.; quinine bisulph. ʒss.; acid sulph. dil. ʒi. aq. ad. ℥viii. M. ℥ss. stat. et rept. omni sec. hora, directing that if anything unusual occurred to send for me at once, but that I'd see her early the next morning. I did so, and to my astonishment, for I thought the amount of relief I might have afforded the old lady never would have satisfied her. She expressed herself very thankful to me, and I saw at a glance that she was much better. Questioning her regarding any sensation she might feel, she complained of numbness and tingling in her fingers and toes; she had had a few hours sleep in the night after four or five doses of the mixture, and it was after the sleep she awoke so much relieved. She apologised for being, as she said, so like a mad woman on the previous evening. I now ordered the mixture to be given only every third hour, and seeing her the same evening so much better, I discontinued the use of the aconite, and reduced the dose of the quinine. She then recovered completely, and I have not since seen her. I tried the strength of the tincture I used in this instance, as follows:—I selected a fine buck-rabbit, and having kept it some hours previously without food, gave it ten drops of the tinct.

1st. Ten drops—no effect.

2nd. Ten drops, one hour after: spasms about the throat and twitchings about its mouth set in.

3rd. Ten drops, one hour after last: more spasms, limited to the mouth and throat.

4th. Ten drops, one hour after last: more spasms, limited to the mouth and throat.

5th. Twenty drops, half-an-hour after: great difficulty of breathing, and spasms of jaws.

6th. Half-an-hour after, twenty drops: same result, increased in energy.

7th. Twenty drops, half an hour after: violent convulsions of all the body, jerkings of head and hind limbs, the latter thrown alternately out, and gaspings; death in about half a minute after the dose, so that *less* than ʒii of this tincture produced death, divided over a period of more than four hours. We may notice, in this case I have quoted, a few points:—1st. The effects of severe cold in developing a disorder latent for so many years, as also that the thumb had recovered the effects of the injury; *it* was the part to originate the general disorder of the nerves of the arm, shoulder, and face. 2nd. The rapid subsidence of such severe pain under the combined influence of aconite and quinine.

Now, before answering the question as far as pathology and physiology will allow us: How do aconite and quinine combined, or aconite alone, affect a neuralgic patient? we must first decide what is neuralgia? and here is the first difficulty. Without entering into varied discussions we may take as the results of the researches of those interested in this curious affection, that it is due to some morbid change in the nerves of parts, often not *recognisable* after death, as slight thickening, vascularity, or pressure from tumours in their immediate neighbourhood, these changes being the active causes which are set in motion by external or internal agencies, as atmosphere in the first case, or stomach and intestinal disorders in the second, both alike giving rise to intense suffering traceable often to no cause, but this external or internal agency which produces, in some unknown manner, a state of increased sensibility of the nerves of sensation of certain regions not even evidenced by any visible changes in these parts, or again to some low state of vitality of certain peripheral nerves, consequent on a disorded condition of surrounding structures, or the direct result of any *injury.*

Looking, now, practically as to the manner in which aconite given internally can be a remedy for any of those morbid states :—1st. As a contra-stimulant either by a direct action conveyed to parts by the blood, as evidenced by the numbness and diminished sensibility, this influence being felt by parts preternaturally excited before acting on the system generally (Fleming). 2nd. By a direct sedative action on the circulation as shown by its action on the heart's pulse. 3rd. By diminished power of sensibility of the brain—it being, as Bouchardat states, a stupifying agent, less powerful than belladonna or opium. We may thus make a two-fold division of its mode of action on a neuralgic part.

1st. Reducing any increased vascularity and excitability.

2nd. Exercising a healing influence on the nerves of the part, and deadening sensibility in the nerves of the affected region, both effects being increased in proportion as it influences the nervous system generally through the brain ; and as Dr. Fleming remarks, "if an organic lesion, resulting from an injury, be not present, our cure may be permanent," if it is only temporary. The physician, always remembering the physiological action of aconite, must seek for those states of the system which contra-indicate its use, and not stigmatise a drug as noxious and dangerous, which, if given in congested states of organs, lungs, or otherwise, will decidedly verify his worst anticipations ; or if in anæmic states of the system we give this powerful drug, we must only blame our own rashness, if its indiscriminate use leads us into trouble.

To enter into the vexed question of the exact way in which quinine acts, whether it is a tonic, acting simply by catalysis (Headland) on the blood, or by giving it some essential ingredient in which it is deficient. For my part, I must confess myself an advocate of the logical conclusions drawn by Dr. Headland on this matter in his recent able edition on the "Action of Medicines," believing quinine to be a restorative medicine, not directly neurotic, and adducing in evidence the discovery of Dupré and Jones by means of the fluorescent test, which establishes the presence of a substance in the blood similarly constituted to quinine. Certain it is that quinine is not excreted in any quantity, and it requires very large doses to detect its presence in the urine. To satisfy myself of this fact, I obtained some pure *quinia* from the Apothecaries' Hall, Dublin, and gave, at intervals, to a healthy man (a pensioner) 33 grains in the 24 hours. He suffered from pains in the loins, head, and back. I got him to pass urine immediately before the first dose, and then obtained all he passed in the 24 hours, amounting to 54 fluid ounces. It was quite clear and *healthy*. I first took two ounces and rendered it slightly acid with tartaric acid, evaporated to dryness, dissolved in absolute alcohol, and evaporated in a water bath, filtered, and extracted the residue, and repeated this process three times. I then extracted the residue with more alcohol, to which remainder, by this time very minute and colourless, I added solution of carbonate of potash, and got a *white precipitate*, perfectly soluble in ether, but failed to get the chlorine and ammonia test on the evaporation of the ether. On again repeating the same process with four ounces of this urine, I got the green with chlorine and ammonia, but from the quantity I obtained altogether from the six ounces, I should say that not more than a few grains passed entirely through the urine. We may thus look on quinine as producing a *permanent* change in the blood, either filling up some deficiency, or producing some change in its integral constituents, and so altering the existing state; and conclude that quinine acts through the blood, and that its effects in nervine disorders are due to this blood action, which is restorative in character. So that it is indicated in any deranged state of the system which clinical experience shows to be the result of certain morbid states of the blood, originating in a deficiency or change in its ingredients, as evidenced by a certain class of affections that follow those particular changes.

Is not, then, neuralgia often the result of such changed conditions of the blood? Pathology, in many instances, can assign no cause for it! Morbid anatomy looks in vain for any state to account for the life symptoms, and though we may have palpable causes during life, and apparent after death, still, in many instances, we can assign no reason for suffering but some debilitated state of the blood, anæmic or otherwise, no practical physician having failed to observe the relation that exists between neuralgia, debility, and hysteria; often do we find all three co-existing in the same individual, and as surely as chlorosis and hysteria are allied, so are neuralgia and other debilitated states. The question arises, then, does not quinine, by altering this morbid state, relieve the condition that it has induced? and this I believe to be its true action. And so we may use it as a valuable adjunct to aconite—1st. In neuralgia occurring in anæmic or debilitated patients, without any apparent nerve-lesion or exciting cause. 2nd. In old cases of neuralgia, where the primary disease has induced a state of the circulation at the part affected not in accordance with health. 3rd. In all cases where, to a temporary relief, we would add permanency of cure.—*Medical Press and Circular, July* 1, 1863, *p.* 5.

23.—A CURE FOR HEADACHE.

By Dr. GEORGE KENNION, Harrogate.

I am desirous of bringing before the notice of the profession a very simple, and at the same time a very remarkable, cure for many kinds of headache. I have not the least claim to the discovery of this remedy, nor, indeed, am I at all aware who was its originator; but I believe that it is unknown to the profession generally; and, having used it for nearly twelve months in a very large number of cases, and very rarely without affording immediate relief, I am desirous of making it more generally known. I heard of it first from a gentleman whom I was attending last year, and who told me that he thought it was used by a French physician. If this should come under his notice, I hope that it may be the means of inducing him to drop his incognito, so that he may receive the thanks of many to whom he has hitherto been an unknown benefactor.

The remedy, as I have already observed, is simple; it is the bisulphide of carbon in solution. Its mode of application is no less simple. A small quantity of the solution (about two drachms) is poured on cotton-wool, with which a small, wide-mouthed, glass-stoppered bottle is half filled. This of course absorbs the fluid; and, when the remedy has to be used, the mouth of the bottle is to be applied closely (so that none of the volatile vapour may escape) to the temple, or behind the ear, or as near as possible to the seat of pain; and so held for from three to five or six minutes. After it has been applied for a minute or two, a sensation is felt as if several leeches were biting the part; and, after the lapse of two, three, or four minutes more, the smarting and pain become rather severe, but subside almost immediately after the removal of the bottle. It is very seldom that any redness of the skin is produced. The effect of this application, as I have said, is generally immediate. It may be re-applied, if necessary, three or four times in the day.

The class of headaches in which this remedy is chiefly useful is that which may be grouped under the wide term of "nervous". Thus neuralgic headache, periodic headache, hysterical headache, and even many kinds of dyspeptic headache, are almost invariably relieved by it; and, although the relief of a symptom is a very different affair, of course, from the removal of its cause, yet no one who has witnessed (and who of us has not seen?) the agony and distress occasioned by severe and repeated headache, but must rejoice in having the power of affording relief in so prompt and simple a manner.

As regards the *modus operandi* of this remedy, it is difficult, perhaps, to form a certain opinion; but I am disposed to attribute it to the sedative effect of the vapour of the bisulphide, absorbed through the skin, and acting upon the superficial nerves of the part to which it is applied. The remarks of M. Delpech (*Annales d'Hygiène*, Jan. 1863) point out very clearly the remarkable prostration of the whole nervous system produced in workmen who, in certain manufactures, are exposed to the vapour arising from a solution of the bisulphide of carbon; and we can readily understand that a somewhat similar effect, upon a small scale, may be produced by the application of this vapour to a limited portion of the surface.

I always procure the bisulphide of carbon from Mr. Morson, the eminent chemist in Southampton Row, Bloomsbury, who will also furnish the bottle with which the vapour should be applied, and a wooden case—a very necessary adjunct, on account of the offensive smell of the bisulphide.

[A correspondent (G. F. E.) of the British Medical Journal, in noticing the above, recommends the use of chloroform in place of the bisulphide of carbon. He says:]

Dr. Kennion, of Harrogate, calls attention to the efficacy of the vapour of bisulphide of carbon in relieving certain forms of headache. I have for a long time been in the habit of applying chloroform in the same manner as he uses the bisulphide of carbon, and with the same happy results. Among other cases I have found it give relief and procure sleep in one of agonising hemicrania, which came on a few hours after childbirth. Without any wish to lessen the merit of Dr. Kennion's suggestion, I have ventured to recommend a different agent for the following reasons:—Chloroform is much more likely to be at hand than the bisulphide; it is devoid of the offensive odour of the latter; and, if I am not mistaken, it will be found quite as effectual. I may add that, in those cases of hemicrania which depend on gastric derangement, eight or ten minims of chloroform, given internally, will materially assist the effect of the local application.—*British Medical Journal, June* 13 and 20, 1868, *pp.* 584, 626.

DISEASES OF THE ORGANS OF CIRCULATION.

24.—ON THE THERAPEUTICAL ACTION OF DIGITALIS IN DILATED CONDITIONS OF THE BLOOD-VESSELS.

By Dr. Archibald Reith, Physician to the Royal Infirmary of Aberdeen.

[There is ample evidence that digitalis has acted as an apparent sedative to an ever-excited heart.]

There is equally good evidence that digitalis has acted as a tonic to the weak and enfeebled heart. As this doctrine is not yet so generally received as the last, I may enter more particularly into its proofs. Withering, in 1785, in his memoir on digitalis, relates cases of dropsy which were cured by free use of the medicine. The description of these cases shows that they belonged to the class which modern physical diagnosis would refer to enfeebled heart. Sir Henry Holland, in his "Medical Notes and Reflections," considers digitalis as more appropriate for an enlarged flaccid heart than for hypertrophy. The late Mr. Jones, of Jersey, speaking of the treatment of delirium tremens by large doses of digitalis, says, "The pulse, so far from being lowered in force, becomes fuller, and stronger, and more regular, soon after the first dose. . . Doses of half a drachm or a drachm do no good whatever; and the pulse, in some cases where I tried them, became intermitting. I have never seen this effect from the larger doses; on the contrary, a feeble intermitting pulse has generally soon become fuller and more regular." On the same subject Dr. Ballard remarks,—"It certainly is not what any one would have expected, that a feebly acting heart would be roused into normal action by a medicine like digitalis; yet this is one of its earliest effects in the doses given by Mr. Jones." Dr. Peacock in like manner says,—"In no instance were any alarming symptoms of depression induced; but the pulse usually soon fell remarkably in frequency, and acquired greater power and steadiness." "The drug, when exhibited in full doses (in delirium tremens), does not by any means produce the amount of depression which our previous experience of its action, in small and frequently repeated doses, would have led us to expect." We are, however, mainly indebted to Dr. Handfield Jones for the elaboration of this important subject. So far back as 1859, he regarded digitalis as a cardiac tonic. He relates two cases, on which he remarks in the following terms:—"No better case could be imagined to test the influence of digitalis, and the result was certainly unequivocal. Instead of causing any further depression of the enfeebled organ, it decidedly increased its tone and power, and enabled it to carry on its function better than when any other remedy was given. If digitalis were in any degree a cardiac depressant, it would have extinguished the weak contractility of the poor fellow's heart, instead of arousing it. . . . On the whole, the two cases related afford some evidence that digitalis is a *cardiac tonic*, and certainly prove that it may be given with advantage in cases of great cardiac debility."

Various writers have confirmed Dr. Jones's statements. Numerous cases are recorded in the medical journals of a similar nature to those commented on by him. An examination of the subject is made by Dr. Murray, of Newcastle, who comes to the conclusion that there is not a single disease or condition of the heart, *attended by weakness*, in which it may not be given with safety and benefit. When rapidity of pulse depends on cardiac weakness, digitalis will reduce it. The weaker the muscular tissue of the heart, the safer will be the administration of the medicine. On the continent also the same opinions are entertained. Winogradoff shows that digitalis exerts no change in the strength of the pressure of the blood in the arteries, and that, therefore, it may be given without risk in morbid conditions attended with diminished pressure, as in morbus cordis, with insufficient compensation. Germain and others regard digitalis as a cardiac tonic. Lastly, I may give the opinion of Dr. Fuller, whose remarks contain the summary of this view of digitalis. He says,—"Experience and observation may be alike appealed to in proof that digitalis stimulates the muscular fibre of the heart, and augments the contractility of the capillaries. When it kills, it does so not by producing paralysis of the heart, but by giving rise to tonic contraction and spasm of that organ. Such being the case, it is a most valuable remedy in the treatment of dilatation, and is dangerous only when administered in hypertrophy. When the pulse is feeble and irregular, and more especially when from any cause its feebleness and irritability are temporarily increased, digitalis is, of all known remedies, the most useful." Dr. Fuller's conclusions on this subject are best given in his own words:—"1st, During many years I have observed that the cases of heart disease most benefited by digitalis have been those in which the heart has been weak and dilated, and the pulse feeble and irregular. In these the pulse has become stronger and steadier, and less frequent under its action. 2ndly, In the only cases in which I have known death to occur suddenly during the administration of digitalis, the heart has been hypertrophied and firmly contracted. . . 3rdly, Dr. Dickenson has pointed out (Med. Chir. Trans., vol. xxxix), and I have repeatedly verified his observation, that digitalis, if given in full doses, induces violent uterine contraction, and checks uterine hemorrhage; and, inasmuch as its action in staying menorrhagia and uterine hemorrhage is permanent, it seems fair to conclude that it gives tone to the capillaries, and increases their contractility. . . . 5thly, When patients die of delirium tremens, the pulse is usually rapid and fluttering before death, and the heart is found weak, flaccid, and distended with blood afterwards. These are just the cases in which, on the commonly received doctrine as to the action of digitalis, the drug ought necessarily to prove fatal, and yet modern experience has shown that in these cases it is tolerated even in excessive doses. . . . 6thly, It has been proved by experiments on animals (Dr. H. Jones) that, when death is induced by digitalis, the heart is not flaccid and distended with blood, as is commonly supposed, but, on the contrary, empty, contracted to the utmost, and in a state of tonic spasm. All these facts confirm my view as to the action of digitalis, and if it is to correct its practical importance in relation the treatment of cardiac dilatation, can hardly be over-estimated."

My own experience of digitalis as a cardiac tonic is fully in accordance with these views. I shall have a few remarks to offer presently on its use in enfeebled heart.

[There are two opinions entertained regarding the therapeutic action of digitalis. By some it is considered a direct cardiac sedative and depressant ; by others a cardiac tonic and stimulant. There is but one way of escaping this difficulty, and that is, by allowing to digitalis a double action on the vaso-motor system, such as recent researches render probable is possessed by medicines in general.]

Is it possible, in the present state of our knowledge, to construct a theory from the accumulation of facts possessed which will tend to reconcile existing differences? I think it is; and will now proceed to do so.

The views which I am about to offer have at least the merit of simplicity. Whether they be accepted as true or not, it will be admitted that they have the support of physiological and pathological observations. Without denying or throwing discredit on a single fact hitherto noted, I am sanguine enough to believe that they will in great measure, remove existing difficulties and diversities of opinion. The evidence is certainly not so complete as could be desired, but as far as present data can guide us, it is sufficient, I think, to warrant a fair conclusion. Further information will probably corroborate the statements I am now to make.

It is of the highest importance, first of all, to have a true conception of the physiological action of digitalis on the healthy body. From the numerous observations which have been made on this point, it would appear that the symptoms manifested by the drug are pretty uniform. Digitalis is, then, what is called an irritant, or, taking the totality of its symptoms, a a narcotico-irritant poison. The powder, when applied to the mucous membranes or to the denuded skin, produces smart irritation. The local inflammation thus created, in accordance with pathological laws, consists of two primary stages. In my first paper (Edinburgh Medical Journal, February 1868), I endeavoured to show that irritation, or a dilated condition of the blood-vessels, depended in great measure on paralysis of the sympathetic system; and that this paralysis necessarily implied a previous condition of excitement or spasm of the blood-vessels. These two actions invariably occur when a stimulus is applied to any tissue or organ. The consequent spasm of the blood-vessels is followed by a corresponding reaction to the opposite condition, or dilatation. The local effects of medicinal agents are similar, and hence drugs may be used in a twofold manner, the primary action of spasm being obtained by a very small dose, and the secondary by a larger one. Digitalis has therefore, like other medicines, a double property; it first excites the vaso-motor system, contracting the blood-vessels, this operation being followed by more or less reaction to paralysis or dilated blood-vessels.

Various therapeutical observations tend to confirm the primary spasmodic action of digitalis. Handfield Jones says,—"Kulp's account of the action of digitalis in inflammatory disease seems to prove that it induces arterial contraction, rendering the hands and face cold. Its action upon the uterus in menorrhagia, and on the arteries in hemorrhages, seems also to be of this kind." Dickenson points out the use of digitalis in menorrhagia, and this has been attributed with propriety to its contractile power on the blood-vessels. Trousseau makes the same observation, though he finds it unnecessary to give large doses for the purpose. Legroux believes that the primary action of digitalis is to narrow the capillaries, but he falls into the mistake of attributing the reduction of the heart's pulsations to this. There is thus, I think, ample evidence obtained from experience and from analogy that digitalis is possessed of the twofold property above mentioned.

Let us now examine its effects upon the heart, in the light of this double action. It seems to be proved beyond doubt that digitalis stimulates the heart to increased power when given in full doses. Physiologically it causes spasm of the muscular tissue, evinced by tumultuous, irregular action, and by the ventricles being found contracted and rigid after death. There is induced, as it were, an artifical hypertrophy, differing only from the morbid condition in the absence of increased development and of valvular disease; unless, indeed, Germain's account be true that digitalis constricts the aortic valves, in which case the resemblance would be well nigh complete. It is hypertrophy, in all but the lapse of time, the muscular tissue not having grown. The rationale of this is that digitalis paralyses the vaso-motor nerves of the heart, whereby greater determination of blood takes place to the ventricular walls; spasmodic contraction ensues, which has the effect of not only emptying the cavity, but also of emptying the vessels of the muscular tissue at the moment of greatest spasm. As relaxation takes place, the blood-vessels became filled, and the cavities distended with blood; but before the ventricle has time to expand sufficiently, it is forced to contract spasmodically again, and thus the action goes on more or less irregularly until complete cessation of the heart's movements. The last closure of the ventricle remains after death, and the paleness which has been observed would be accounted for by the absence of blood in the tissue. Sometimes, as in Bernard's examples, slight relaxation occurs after the final spasm, owing to blood coming from the lungs entering the left cavities, but this is succeeded almost immediately by permanent rigor mortis. The apparent weakness and irregularity of the pulse may be thus satisfactorily explained; and the so-called sedative action of digitalis in fevers and inflammations is shown to depend not on the reduction of the pulse, but on the increased force of the ventricular contractions. The success which is said to attend the practice of freely exhibiting digitalis in such cases is not very equivocal.

It is, then, paralysis of the vaso-motor nerves, and determination of blood to the heart, which characterise the physiological action of digitalis. This implies, however, that there must have been a previous action of excitement of the sympathetic, or spasm of the cardiac blood-vessels. The physiological action is in reality the secondary, and cannot take place without a prior stimulant effect on the nerves. It is not very easy to demonstrate this, on account of the rapidity with which the primary effect disappears, but it may be done from the following considerations:—

1. A dilated condition of the blood-vessels, or paralysis of the sympathetic, must have been preceded by spasm (excitement of sympathetic), of however short duration.

2. With the majority of medicines this state of spasm is usually more or less imperceptible, partly on account of its comparatively short duration, and partly because it may be too limited to produce appreciable symptoms. It may be impossible to demonstrate its existence by any symptom except by the curative effect of a medicine given so as to produce only a spasmodic effect on the vessels.

Applying these considerations to digitalis, we conclude that its physiological action is preceded by stimulus of the sympathetic or spasm of the cardiac blood-vessels. Fortunately we are able to take cognizance of this primary action; for not only is it manifested in various parts of the body, as evidenced by the therapeutical observations formerly mentioned, but it is also witnessed on the heart itself in cases of poisoning. Various writers have stated, that, in their experiments, the heart's action is momentarily quickened before it begins to act spasmodically. The same phenomenon occurs sometimes during the administration of aconite, a notably increased frequency of pulsation having been occasionally observed prior to the true depressing action of the drug. In neither case is it the quickening of increased circulation, but that of diminished supply of blood, rendering the heart's action similar to what it is towards the close of a fatal illness. When we put all these facts together, therefore, there is fair reason for regarding the symptoms produced by digitalis on the heart as of the twofold character already described; what is known as its physiological action depending on increased determination of blood to the muscular tissue,—this, in its turn, being a reaction from a previous condition of spasm.

Although aconite and digitalis have the same action on the cardiac blood-vessels, there is, nevertheless, a marked contrast between them. The former seems to influence the whole nervous apparatus, while the latter acts on the vaso-motor nerves alone. From the investigations and experiments of Winogradoff and Dybkowski and Pelikan on digitalis, and of Liégeois and Hottot on aconite, the following results are obtained:—The action of digitalis is not identical with stimulation of the pneumogastric, for, when that nerve is galvanized, there is not only diminished frequency of the pulse, but a sinking of the mean pressure of blood in the arteries, a condition not produced by digitalis. Under the influence of digitalis, Dybkowski and Pelikan found that the action was not delayed or altered by destruction of the medulla oblongata, or by section of the pneumogastrics. Galvanization of the pneumogastrics also produced its usual effect of slowing the heart's action, even when the system was under the influence of the poison; while, as a rule, galvanization of the vaso-motor nerve, when the heart was stopped, did not re-excite its action. From these experiments it seems that the determination of blood to the heart, which aconite produces, is attended by an influence on the pneumogastrics and whole nervous apparatus, while digitalis acts only on the vaso-motor nerves. Moreover it would appear also that the action of digitalis is limited to the ventricular portion of the heart. The post-mortem appearances reveal the fact, noticed by many, that the left ventricle almost always remains strongly contracted, quite empty and pale, while the auricles are distended and full of blood. The power of aconite is, therefore, much greater than digitalis: first stimulating the cardiac sympathetics, it causes slight quickening of the heart's movements, subsiding immediately through the influence on the pneumogastric nerves to great slowness and feebleness; and this is followed by more or less re-action, to increased force and frequency of the pulsations. Digitalis, on the other hand, by simple excitement of the ventricular vaso-motors (contracted vessels), temporarily quickens the heart's action, and then, through paralysis of those nerves (dilated vessels), spasm of the muscular tissue follows, as before detailed.

The foregoing views of the physiological action of aconite and digitalis will throw considerable light on their application to therapeutics, and confirm, in a striking manner, previous empirical observations on the subject. In the majority of cardiac affections, one or other of these two medicines will be found more or less remedial. Deprived of them, we should lose the very best means we possess of relieving suffering. The difficulty consists in selecting the proper remedy for the particular case. The general guiding principle in their selection may be thus expressed:—

The corresponding symptom of aconite is paralysed general nervous action, or fever.

The corresponding symptom of digitalis is paralysed limited nervous action or hypertrophy.

Aconite, therefore, is the prime remedy for the febrile state, when given in very small doses, as stated in my last paper; digitalis is the remedy, in very small doses, for hypertrophy. Now, here is the point where the old and the new opinions come into collision—one party declaring that it relieves hypertrophy, the other stoutly maintaining that it aggravates it. What is the real truth of the matter? Just this, that in doses large enough to induce reaction, digitalis will prove hurtful, if not dangerous, in hypertrophy; but in much less quantity, or stimulating doses, it will prove beneficial. The statements of the best observers are in favour of this view. It has been found that the beneficial effects of digitalis in hypertrophy were best marked in small doses. Trousseau and Pidoux say:—"These experiments are, moreover, confirmatory of a fact long since acknowledged, namely, that to exercise its sedative action on the circulation, digitalis must be administered in small doses. Hypertrophy, then, requires only the primary action of digitalis for its relief, and will be aggravated by any approach to the secondary. But we can suppose a condition of the heart existing where a hypertrophic state would be required to effect a cure, and any drug that would physiologically create hypertrophy would be the proper remedy in the case. Such a condition is found in dilatation and enfeebled heart, and such a drug is digitalis when administered in physiological or tonic doses. The experience of every one must confirm this view.

Let us suppose an analogous case elsewhere. We wish to cure diarrhœa or a dilated condition of the intestinal blood-vessels. The best remedy for the purpose is one which, in physiological doses, will produce corresponding symptoms, *i.e.*, a purgative; but to give it in such doses would only aggravate the existing diarrhœa. It is necessary, therefore, to administer the drug in doses small enough to do no more than induce its first action, or contraction of the blood-vessels. The irritation is thereby arrested. But let a condition exist which requires dilatation of the blood-vessels for its relief, then a purgative in physiological or purgative doses is the proper remedy. Constipation is such a condition.

Take another analogous case. There are many points of resemblance between digitalis and the ergot of rye. Both produce general contraction of the blood-vessels, and though the brunt of the former falls mainly on the heart, its action on the uterus closely resembles that of the latter. When we wish to check menorrhagia, or threatened abortion, we can find no better remedy than ergot, which, in small doses, contracts the uterine vessels; but when we wish to expel a detached ovum, a tumour, or a full-grown child, or to close the uterine sinuses in post-partum hemorrhage, the main remedy on which we rely is still ergot in physiological doses. Its first action of spasm is succeeded in these cases by dilatation of the uterine blood-vessels, and determination of blood to the organ. Muscular contraction accordingly takes place, whereby the contents of the cavity are expelled, or the sinuses closed. A large dose of ergot is often found to cure a simple menorrhagia, but this arises from the muscular contractions closing the dilated vessels, so that in either case a cure is effected, although it is quite unnecessary to give more than small doses, sufficient to cause spasm of the vessels without influencing the muscular fibre.

And so it is with digitalis in heart-disease. An hypertrophied heart is analogous to a uterus affected with menorrhagia; a dilated heart resembles the uterus suffering from inertia. The same remedy will benefit both conditions. In the former case, a minute dose is all that is required; in the latter, the physiological action must be induced. But just as purgation is a rough method of treating constipation, and only to be adopted as a temporary expedient, so the treatment of enfeebled heart may turn out but a rough process, to be superseded when we find better means of relief. At all events, in my practice, the increased strength afforded to the dilated heart has been always temporary, and entirely dependent on the continued administration of the medicine; while, in a month or two, most of the patients—and I have seen a good many—died in spite of the treatment. We all know how purgatives fail us more or less after a time.

Let me, in conclusion, give a few hints regarding the application of digitalis to the treatment of enfeebled heart. It must be borne in mind that, prior to its physiological action, it has a contractile influence on the cardiac blood-vessels. Some hearts are so enfeebled that, before the secondary effect of digitalis takes place, there is great risk of the primary contraction putting an end to their movements altogether. Two cases have come under my notice in which sudden death took place after one or two doses of digitalis, the pulse not being in the least degree altered till it failed. Several writers mention the same occurrence, and attribute it, I think properly, to the medicine. Dr. Wilks and others think, from their post-mortem examinations, that the sudden death should be set down to degeneration, and not to digitalis; but this only confirms the opposite opinion, for the more the heart is degenerated the more likely is contraction of its vessels to extinguish what movement it has. If the heart can stand out till reaction takes place, then much benefit is obtained, and the muscular tissue is strengthened; but if not, then sudden death will occur, or, at all events, great faintness and other alarming symptoms. There is thus very great danger in administering digitalis when the ventricle is very much weakened, even although its administration would be followed by relief to the symptoms. A careful examination of the heart is therefore necessary in all cases before prescribing such a dangerous drug. In those instances where degeneration is not much advanced, it may be given freely, but in other cases with the utmost caution, and in comparatively small quantity As it is, however, commonly impossible, by mere physical examination, to determine the exact amount of change in the muscular tissue, it is better, in all cases, to begin with a very small dose. I commonly give ʒij of the infusion, but the more I see of its effects, the more I am inclined to diminish the quantity still lower. I believe five drops of the tincture have caused alarming symptoms. The patient must be sedulously watched, with stimulants at hand in case of accident; and as soon as the pulse has become stronger and more regular, the medicine must be suspended, to be renewed after some days, if necessary. In most cases it will be found that the benefit is only temporary, for the organic change goes on, and destroys life sooner or later—in my experience within a month or two.

In some cases of hypertrophy aconite is preferable to digitalis, in doses suitable for the febrile state (gtt. $\frac{1}{4}$ — gtt. j). They are those in which the circulation is generally active. Dr. Walshe approves of this remedy in such conditions. I have presently a patient under my care who keeps aconite always beside her, and when the heart beats tumultuously, gtt. $\frac{1}{4}$, taken in water, quiets its action. Hypertrophy, however, should generally be let alone; being compensatory, any interference with it might cause danger. Digitalis in small doses, or aconite as above, will, in most cases, quiet undue action.

I have little experience of the treatment of delirium tremens by digitalis. What I have leads me to the conclusion that it is useful only in asthenic cases, and dangerous when the pulse is full. The toleration by the system of large doses seems to be due to the counteracting effect of alcohol. At all events, the benefit derived is due to the physiological action of the drug: whether on the heart or on the brain, or on both, is unknown. —*Edinburgh Medical Journal, Sept.* 1868, *p.* 211.

25.—VERATRUM VIRIDE IN PERICARDITIS.

By Dr. J. WARING-CURRAN.

[Veratrum viride by its certain power, if carefully watched in its administration, of reducing the frequency of the pulse, and thereby affording relief to palpitation and tumultuous action, becomes a remedy of value in some cases of pericarditis.]

I invariably employ the extract—considering it the safest and surest preparation—made by inspissating the juice of the root, and prescribe it in two grain doses, with one grain of calomel in the form of pill, every two hours until its effects are readily discernible. The distressing symptoms are then kept at bay until the calomel does its duty, and the disease mastered. Advocates for local or, perhaps, general depletion, have only to observe its therapeutic influence once, to feel convinced that we *do* possess a remedy which will afford all the benefits to be obtained from either bleeding, leeching, or cupping, without impoverishing the blood and increasing the tendency to serious effusion, constituting *hydrops pericardii*, which has been unfortunately not an unfrequent consequence of this disease, particularly in hospital practice.

The history of the three following cases will impart all that I would fain convey on the subject:—

Case A.— R. R., aged 27 years, the subject of rheumatic fever, for which he has been under treatment six days; on the seventh day of his illness he presented all the well-marked symptoms of pericarditis. On going into the room I noticed that peculiar distressed, broken-hearted appearance of face so indicative of cardiac mischief; there was visible pulsation of carotids, hurried respiration, tumultuous action of heart, and *decubitus* on right side. He complained of severe lancinating pain extending up between the shoulder-blades to the left side of neck, thence extending down the arm of same side; pulse 130; respirations 40; skin dry; tongue parched; secretion arrested; high fever. On practising auscultation, a well-marked *to-and-fro* sound is audible, all the unequivocal symptoms of acute pericarditis being present. I immediately put him on two grains of the extract of veratrum viride, and one grain of calomel, to be given in pill every two hours, with a potass mixture, and a mustard blister to be applied over the cardiac region.

Evening Visit.—Pulse 60; respiration 20; bowels have been operated on twice, bilious, feculent stools; passed a large quantity of acid urine; more free from pain, and expresses himself easier.

Owing to vomiting, which set in later in the night, I discontinued the veratrum, and prescribed an an effervescing mixture containing dilute hydrocyanic acid.

The following day there was an aggravation of the symptoms – the veratrum was renewed, and steadily employed, discontinuing it when the symptoms required me, until a complete and satisfactory cure was effected. The patient recovered without a bad symptom, and is now attending to his usual avocation.

Case B.—This was also a well-marked case of rheumatic pericarditis, presenting all the symptoms of the complication to a marked degree. The veratrum brought down the pulse from 120 to 70 in the course of twenty-four hours, increased the secretions, and produced a most desirable termination.

Case C.—Pericarditis with severe dyspnœa and violent interscapular pain; irregular pulsation and congestive tendency. The veratrum produced its usual effects, and, combined with the calomel, in a few hours alleviated the suffering of the patient, increased the secretions, and relieved the pulmonic circulation. The patient is now as well as ever he was.

In three cases of acute rheumatism, in which pericardial symptoms threatened, although did not postively manifest themselves, I feel assured that the mischief was baffled by the early and careful exhibition of ten-drop doses of the tincture of veratrum viride in the athritic mixture.—*Medical Press and Circular, Sept.* 9, 1868, *p.* 223.

DISEASES OF THE ORGANS OF RESPIRATION.

26.—ON TUBERCLE, ITS BIRTH, LIFE, AND DEATH.

[The following valuable article is by the Editor of the British and Foreign Medico-Chirurgical Review, and may be considered as a review of recent works on Tubercle.]

It may, perhaps, be well, before proceeding with our subject, to say a few words against the tendency, which has long and much prevailed, to regard diseases as strange entities, or to confound disease itself—a complication ef effects produced by certain causes in the tissues of the body—with the causes of disease. Thus fallaciously guided, the student of biology, instead of being led step by step up a gradual ascent from the study of physiological to that of pathological processes, is made to spring over a wide gulf into a new and strange land. The truth is, that we pass by a scarcely perceptible transition from the phenomena of healthy nutrition to hypertrophy, inflammation, tubercle, tumours, fevers, and other forms of perverted nutrition or disease. A hypertrophy may be an excess of healthy nutrition, or it may be what we call disease; this distinction being not one whit founded on intrinsic differences, but being an arbitrary distinction of our own according to the usefulness or harmfulness. as observed by us, of the changes which take place. We see a blacksmith's arm enlarge as he works at his forge, and we see a thyroid or cervical gland enlarge from some cause which we cannot so clearly appreciate. We examine the condition of the tissues in both, and we find in both alike what we call hypertrophy or hyperplasia. The elemental increase in both is identical, but we call the one "healthy action," because we see why it occurs and what a useful purpose it subserves; while we denominate the other "disease." because we cannot see its purpose in the economy, and therefore regard it as hurtful. From hypertrophies to tumours is but another mere step or shade of gradation. Between certain tumours, in their early stage, and products of inflammation, no distinction can be made: and we shall hereafter see how identical in their structure are tubercles with products of inflammation on the one hand and certain tumours on the other. Hence, from the merest hypertrophy up to the most aberrant form of tumour, disease is nothing more than an unusual activity or perversion of the very changes which are ceaselessly going on in the nutrition of the body, and which constitute what we understand by the life of the individual.

Perhaps nowhere is the *birth* of tubercle better studied than in the pia matter of a person who has died of acute tubercular meningitis. A piece of this membrane, spread out and examined under a moderately high power of the microscope, is found to be the seat of an extraordinary cellular increase. The cells and nuclei which mark this increase or proliferation are seen part scattered profusely and at random through the membrane, giving it the well-known milky appearaece that it offers to the naked eye, part clustered into little whitish or grayish knots or particles—the individual tubercles. A close scrutiny of these latter will show that they are especially abundant along the smaller branches of the cerebral arteries, and seem here to take their origin in the cells of the connective tissue which composes the adventitia or outer coat of these blood-vessels. So markedly is this the case that, although the tubercle cells must be allowed to arise from the connective-tissue-cells of the membrane generally, yet the adventitia appears to be certainly the part most actively concerned in their development. The tubercle-cells generally are rather smaller than a white blood-cell, have faintly granular contents, and are very brittle, so as very readily to rupture and set free their shining nucleus. Towards the border of the tubercle are seen cells larger than the above, often containing many nuclei, and manifestly representing connective-tissue-cells in a state of active hyperplasia or tubercular development. In and among the cluster of cells which compose the tubercle is a faint stroma, the original connective tissue, together with, occasionally, blood-vessels, not newly formed, for tubercle is non-vascular, but belonging to the tissue in which the tubercle arises. Very much the same appearance is obtained from fine sections of liver or kidney, and from serous membranes affected with tubercle, the connective tissue in all cases serving as the matrix for development. In the lungs, wherever connective tissue is to be found there may tubercles be present : but whether tubercle may also be developed out of the epithelium lining the alveoli and grow inside the air-cells, is a point on which we find our authors at issue. Virchow denies that the little deposits found *inside* the air-passages and air-cells are tubercles. For him these are mere products of inflammation or catarrh which choke up the small bronchi and, on section, so closely resemble tubercle proper that they may be called "spurious tubercle." He professes himself able to distinguish between these spurious tubercles and the true tubercles of the connective tissue, a distinction which, if it be real, must require unusual skill and assurance to make. Villemin, on the contrary, maintains that there are positive intra-vesicular tubercles, which are no more the products of catarrh than the extra-vesicular. Careful microscopical observation enables him to assert, that the fine wall which partitions off the air-sacs from one another is not a homogeneous membrane, but encloses in its substance a cellular element peculiar to itself. Under a high magnifying power a beautiful network of capillaries is seen covering this wall, between the meshes of which network he can detect a cellular element occupying nearly the whole of each open space. There is, he asserts, no epithelial lining to the alveoli, but the tubercles are formed out of the above cells, and grow into the cavities of the air-sacs, filling them up. Lebert, again, believes that pulmonary tubercles or granules, as he calls them, take origin indifferently in the cells of the connective tissue or in the epithelium of the alveoli, being both intra- and extra-alveolar. If, he says, you call the little particles outside the alveoli tubercles, you must call those that are within likewise tubercles. They are all a part of the same disease, a result of the self-same irritant. Bizzozero likewise holds that the little intra-alveolar masses which accompany tubercle are really tubercles and spring out of the epithelium that lines the alveoli. In the case of the lymphatic and ductless glands, Virchow, though he alludes on more than one occasion to the closeness of the link which binds the connective tissue with the lymphatic system, yet insists that it is in the connective-tissue-framework of these glands, not in the gland-cells, that the tubercles originate. But Villemin, looking at the connective tissue and lymphatics as parts of one great system, which he designates the "lymphatico-connective system," believes that tubercle may originate both in the cells and in the connective tissue of the lymphatic and ductless glands. Hence, in tubercular disease of these organs, the microscope cannot of itself distinguish tubercle from simple hyperplasia, inasmuch as elements identical with those already existing in health are simply reproduced in excess. It is, consequently, a matter of extreme difficulty, nay, in some cases impossible, to say whether a given change in one of these glands is simple hyperplasia or tubercle. This question, then, must remain for the present an open one. That tubercle originates mainly in the connective tissue is the expressed opinion of all these modern authors. That it may also find a nidus of development in epithelium and gland-cells is probable, but not yet clearly determined.

Tubercle has the shortest *life* of any pathological product ; it is born but to die. Hence its power of growth is exceedingly limited, and its hurtfulness, when solitary, but small. Herein, however, consists its deadliness—that it is the expression of a general disease ; that the same cause which produces it is circulating through the body, and may produce thousands similar to it wherever connective tissue is present ; and that it has, as Virchow was the first to point out, manifestly malignant properties, spreading to the tissues in its neighbourhood and infecting distant organs by dissemination of its germs or juices. Thus, though there is a marked limit to the size of the individual tubercle, there is no limit to the size of the masses that are formed by agglomeration of tubercles, or to the number of tubercles which may be scattered through the body. Do we not see in these properties something that reminds us of the outbreak of an eruptive fever, and something, too, that recalls the behaviour of cancer?

An early *tendency to die* is, then, the most characteristic and distinguishing mark of tubercle. Fatty degeneration, beginning first at the centre of the knot, gradually spreads to the circumference, and gives it the well-known yellow colour from whence the name of "yellow tubercle" is derived; till, little by little, the whole particle softens and breaks down into a "cheesy" granular *débris.* We have, therefore, but to picture to ourselves a large cluster of tubercles passing through this change in the midst of some organ, as the lung or the kidney, in order to understand what wholesale devastation may be thus wrought, and how a cavity or "vomica" may be formed, in which are contained the remains of the softened tubercles, and of the broken-down tissue involved by the tubercles in destruction. On the other hand, if the part diseased be a free surface (as a mucous membrane), the disintegration and softening of the tubercular mass will give rise to the formation of an ulcer which differs from the ordinary process of ulceration by the fact that the base and sides of the ulcer are walled in by the remaining tubercular matter.

Foremost among *the diseases which, either anatomically or clinically, bear decided marks of relationship to tubercle,* stands scrofula. The word "scrofula" seems to have been originally employed to designate a chronic swelling of the cervical lymphatic glands, in consequence of which the neck loses its contours and comes to bear some resemblance to the neck of a "scrofa" or pig. It was then noticed that certain eruptions of the skin or affections of the mucous membrane were accompanied by this same glandular enlargement, and it was agreed to include them too under the title of scrofula. After a while, it followed that every glandular enlargement, no matter where situated, must be a manifestation of scrofula. Certain internal glands, as the bronchial or mesenteric, where now observed to be often in a state of hypertrophy and cheesy degeneration, while, at the same time, tubercles were present in the lungs or bowels. What more natural than to look at the ganglionic lesion and the tubercular products as the common effects of the same cause, scrofula? The thing seemed clear enough, especially when the French school detected the same, "specific cells" in the cheesy scrofula of the glands as had been found in the cheesy tubercle of the lungs and intestines. Thus the terms scrofulous and tubercular came to be synonymous, and a scrofulo-tubercular diathesis was a convenient refuge for the destitute in all doubtful cases. Gradually, however, facts in contradiction of this view began to accumulate, and to be noted down by independent observers. Foremost among those who combated the identity of the two diseases was our own Jenner, whose masterly exposition of the subject, (Med. Times and Gaz. March, 1860), is well known to all. Virchow at the same time completed Jenner's clinical picture by upsetting the doctrine of specific tubercle-elements, and showing that the cheesy metamorphosis is peculiar neither to scrofula nor yet to tubercle, but is met with as a termination of simple inflammation, of syphilitic tumours, of farcy-buds, and sometimes of cancer. Both Virchow and Villemin look on scrofula and tubercle as distinct things. In the opinion of both pathologists, scrofula signifies a weak, "impressionable," or "vulnerable" state of the body, in consequence of which, irritants act upon the tissues with unusual severity and *persistence.* From this point of view, a simple glandular swelling following an ordinary irritant is not scrofulous; but when a superficial irritation of the skin or mucous membrane *persists*, and is followed by swelling of the adjacent glands which likewise *persists* even after the primary irritation has been removed, we have a scrofulous person before us. Three great groups of glands may thus be affected with a scrofulous or chronic change,—the cervical, the bronchial, and the mesenteric. Villemin is of opinion that no anatomical distinction can be made between the scrofulous and tubercular gland; that in both there is simple hyperplasia with a retrograde tendency. He thinks that it is in the exciting cause that the true distinction is to be sought; scrofula being a mere tendency to chronic glandular enlargement in consequence of slight external and *local* causes or irritants, in a child whose lymphatic system is unusually impressionable; tubercle being, on the contrary, due to a specific cause or virus which provokes a more *general* outbreak. That which holds good for the glands holds good equally for the bones, in which scrofulous disease is a mere chronic and very persistent inflammation, while tubercular disease is a specific lesion. Scrofula is, further, a disease almost peculiar to childhood; it is, therefore, intimately connected with the development of the body, and manifests its presence at a time when the lymphatico connective system is in the zenith of its functional activity. Tubercle, on the contrary, prevails between twenty and thirty, at an age when scrofula has ceased to disturb the body. Scrofula is not hereditary as a disease; but the exaggerated lymphatic vulnerability which favours its attack is strongly hereditary. Virchow goes still further, and finds a positive anatomical difference between the scrofulous and tubercular lesion in the diseased gland as well as in the lung. In the gland, scrofula is for him a simple chronic hypertrophy of the glandular tissue generally, with a tendency to "nekrobiosis" or degeneration ; tubercle is a true neoplasm forming in the connective tissue only of the gland and not involving, save by extension, the proper glandular structure. In the lung, tubercle is in the connective tissue alone ; scrofula, or "scrofulous pneumonia," is a chronic inflammation of the bronchi and air-cells, which become stuffed up with their accumulated contents in a state of cheesy degeneration, and form cheesy deposits of larger or smaller size according to the extent of the inflammation. No one who has had much to do with children's diseases can hesitate to accept the accuracy of this distinction. These cheesy patches in the lungs, accompanied by cheesy degeneration of the bronchial glands, without a trace of anything like a tubercle in any part of the body, are, from time to time, met with. We cannot avoid, therefore, accepting a scrofulous pneumonia in youth as distinct from tubercular disease. At the same time we agree with Villemin that Virchow and his followers ride their hobby a little too hard in the case of the cheesy infiltrations which accompany real tubercular disease in adults. These, the Germans assert, are not softened tubercular masses but are mere patches of chronic inflammation that accompany the tubercles, and have passed through the same cheesy metamorphosis that tubercle itself undergoes. It is in vain that you put before them their own assertion that degenerate products of inflammation and degenerate tubercle are exactly similar in appearance, and that these patches are, therefore, at least as likely to be tubercles as inflammatory products, or that you point to the tubercles grouping themselves around these patches as if ready to form fresh ones. You are told that what you see are not tubercles, but sections of small bronchi filled with catarrhal accumulations. Lebert simplifies this matter most agreeably by assuming that there is no such thing at all as tubercle, but that all these deposits, intra and extra-alveolar, miliary and diffuse, grey and cheesy, are nothing but inflammatory products. We shall return to this difficulty under the head of inoculation. It is thus seen that tubercle and scrofula, though they have, anatomically considered, certain marked affinities with one another, are yet essentially distinct diseases.

It is in *glanders* that Villemin thinks he has found the closest marks of analogy with tubercle, not only in its anatomy, but also in its symptoms and causation. He seems to have been conducted from the study of glanders direct to the inoculation of tubercle. The characteristic lesion of glanders is a small tubercle which is strewn either in the mucous membrane of the nasal passages, or in the lungs, or, more rarely, in the liver and spleen. At first a greyish-white firm granulation, composed of cells and nuclei apparently developed by hyperplasia of connective tissue, it soon tends to soften centrally and form ulcers on the mucous membrane, cavities in the lungs. Like miliary tubercle, it occurs isolated or in clusters. Together with this little granulation, streaks and bands of fibrous tissue, as well patches of cheesy infiltration, are not infrequently met with in the lungs of glandered horses. It is interesting, too, that the same doubts have been raised concerning the real nature of these "infiltrations" in glanders as in tubercle. They are regarded by Villemin as one form of glanders, just as in man they are one form of tubercle. As to which is the part primarily affected in glanders—the nasal membrane or the lungs, there is some difference of opinion; Virchow maintaining that the deposits in the lungs are always secondary and by metastasis from the nasal membrane; Phillippe and Bouley being convinced by repeated post-mortem examinations that the primary lesions are always in the viscera, more particularly the lungs, and that the formations in the nasal membrane are invariably secondary. If, say they, a horse has the "jetage" (discharge from the nose), he is already thoroughly glandered. It really matters very little which part of the body is first affected. In either case the analogy with a tubercular outbreak remains as strong as can be. The intestinal ulceration of tuberculosis—in which we see the counterpart of the nasal ulceration in glanders—is more often secondary to the pulmonary disease, but occasionally shows itself before any evidence of mischief can be detected in the lungs. Again, glandular enlargement of a severe and persistent kind, constitutes an important part of glanders as it does of tubercle. The mode of invasion is likewise identical in the two diseases; now acute, foudroyant, destroying life in a few days as by an overwhelming blood-poison, now chronic so as to last for years. Further, in the chronic form, the same recurrence of acute attacks complicating and adding to the chronic mischief is observed in glanders as in tuberculosis. To read a description of chronic glanders is, *mutatis mutandis*, to read an account of chronic phthisis. It is, therefore, not surprising that Dupuy goes so far as to say that glanders is a tubercular disease in the horse. In speaking of the supposed causes of tubercle, we propose presently to follow out still further this remarkable thread of resemblance; but for the present it will suffice to say that glanders is transmissible by inoculation, and contagious from horse to horse, and that it is also unmistakeably communicable from horse to man. Can we hesitate to believe, says Villemin, that the parallel between tubercle and glanders must here find its completion? To conclude, glanders and tubercle are so closely akin that they must be looked upon as nearly related species of the same genus.

Syphilitic formations have in certain organs, more particularly the brain, so close a resemblance to tubercle that the one may well be mistaken for the other. We see in both, the same little cells and nuclei forming apparently by proliferation of the connective tissue and heaped together in an inter-cellular substance; in both, too, a tendency to fatty degeneration, though less prominent in the syphilitic gummy tumour than in the tubercular deposit. Syphilis must therefore take its place with glanders and tubercle as one of a family.

Who is there that has watched a case of acute tuberculosis from its outset, but must have been impressed with the remarkable similarity that it bears to the eruptive fevers, and, more especially, *typhoïd fever.* It is, indeed, doubtful whether in the first few days of the attack it be possible to make a diagnosis in such a case. It is only as the disease makes progress that special symptoms declare themselves, which enable a careful physician to recognise the presence of this most deadly of diseases. The question as to how far tubercle and typhoid fever are antagonistic is disputed. Villemin is strongly in favour of such an antagonism. He maintains that those who speak of fever as a frequent precursor of tubercle have been led into error by the great likeness of acute tuberculosis in its early stage to typhoid fever. What they have witnessed has been tuberculosis throughout, and not fever followed by tuberculosis. Murchison's authority is as strongly against any such antagonism. He says:—"Whether it be true or not that persons labouring under phthisis are rarely attacked with pythogenic fever, an attack of pythogenic fever is often followed by tubercular deposit in the lungs." But this is certain, that the post-mortem appearances in the liver, spleen, kidneys, and intestines of persons who have died of acute tuberculosis have sometimes a most striking resemblance to the appearances in the same organs after death from fever.

From *cancer* in its early stages tubercle in its early stages is structurally indistinguishable. Both take origin from the connective-tissue-cells, and tubercle has been already shown to have malignant properties which assimilate it to cancer. There are. likewise, cases of acute general cancerous eruption which have some points of resemblance to acute tuberculosis. Cancer, however, has an innate vigour and power of growth which sufficiently characterise it as contrasted with the sorry degraded tubercle and its kindred.—*Brit. and Foreign Medico-Chirurgical Review, July,* 1868, *p.* 27.

27.—ON THE NATURE AND TREATMENT OF PULMONARY CONSUMPTION, AS EXEMPLIFIED IN PRIVATE PRACTICE.

By Dr. Charles J. B. Williams, Consulting Physician to the Hospital for Consumption at Brompton; and Dr. Charles Theodore Williams, Assistant-Physician to the same Hospital.

[The development of pulmonary consumption seems to have been determined by inflammation in some form in about 30 per cent. of cases. A predisposition or dyscrasia is however generally required to give to inflammation this peculiar result.]

We have before alluded to the modes in which the consolidation of the lung induced by pneumonia or pleuro-pneumonia may terminate in phthisis, either acute or chronic. We shall here advert only to the chronic results. The exudation material thrown out by the inflammation fills and obliterates more or less of the air-cells of the lung, and converts the tissue into a tough solid, impervious to air, and incapable of carrying on its proper function. This cacoplastic deposit, being usually of a contractile nature, tends in time to shrink further, so as to still more diminish the volume of the affected lung, and to prevent its taking part in the respiratory movements. All that these movements can do, to draw air into the lung thus obstructed, is to dilate the bronchial tubes that remain pervious; and this general dilatation of the bronchi is commonly found in connexion with this chronic consolidation of the lung. This appears to be identical with the affection described by Sir D. Corrigan as *cirrhosis of the lung;* and more recently by Dr. Andrew Clark as *fibroid phthisis.* Its inflammatory origin is generally to be traced both in the history of the case and in the fact that the undoubted products of inflammation are always found in conjunction with it in the pleura, which is firmly adherent to the lung by a tough fibrous material like that pervading the condensed lung.

But this change of structure is truly also a step towards phthisis; for it not only abridges the function of the lung as an organ, but it brings a part of its material into a lower state of organisation, and therefore more prone to decay; thus the whole system often sympathises with it, convalescence being imperfect, with a tendency to continued loss of flesh and strength. A person in this condition, under circumstances trying to the general health—ill-fed, ill-lodged, imperfectly clothed, confined in impure air, or exposed to cold, damp, or sudden change of atmosphere, and the like,—is pretty sure to go into consumption. The cacoplastic deposit in the affected lung undergoes further degeneration and softening, miliary tubercles form in the other lung, and the disease runs its course.

But if placed in *favourable circumstances*, such cases may very commonly be saved from this fate, and restored, if not to perfect health, yet to a state compatible with life and moderate activity and enjoyment for many years. The following cases are a few out of many that might be adduced to exemplify this statement. The first is given as an instance of inflammatory consolidation, with its concomitant dilated bronchial tubes degenerating into phthisis. Then follow others in which this issue has been hitherto averted, and the patients restored to fair health. And lastly, there are mixed cases, in which the phthisical disease has proceeded even to the formation of cavities, and yet it has been subsequently arrested; but the cicatrisation of cavities and the contraction of the indurations around them have ended in a condition more allied to habitual asthma, comprising more or less pulmonary emphysema, which has a mechanical influence in restraining further solid deposits in the lungs.

Case 29.—A lady, aged 35, was first seen Dec. 14th, 1841. Had three children and four miscarriages. Had suffered from phlegmasia dolens, mammary abscess, and other puerperal complaints. Twelve years ago had right pleurisy; and ever since breath has been short, with some cough. Suffered lately from pain and tightness of the chest. Occasional hæmoptysis to the amount of several ounces. Has been often bled for the tightness of the chest, and with much relief; but has lately become very pale and weak. Cough has increased, and is occasionally accompanied with profuse muco-purulent expectoration and night-sweats; aphonia; pulse 120. Physical signs: Dulness throughout right chest, especially in the lowest parts, where there is little motion. Tubular breath in middle, front and back. Cavernous sounds in lower back. Subcrepitus under left clavicle; breathing puerile below, throughout left chest. Heart beating under sternum. Liver enlarged. Ordered iodide of iron with tincture of hops, and aconite ointment for neuralgic pain.

March 8th, 1842. In the country, and improved in breath and colour, but lost flesh, and in last few days had pain and œdema of left leg. Cough better, with expectoration more mucous and slightly tinged with blood. Physical signs: Breath and voice loudly amphoric in lower right back; obscurely vesicular above, but shortened. Right front very resonant, with loud cough, and tubular breath. Tubular sounds under left clavicle. Dyspnœa and weakness increased, with extensive œdema in both legs up to the abdomen; and she died on the 11th of June.

On post-mortem examination, the left lung was found to contain scattered grey tubercles in the upper lobe, and a small cavity, with broken down walls, at apex, where the lung was adherent to the chest. The right lung was adherent on all sides, except in front; adhesions being tough and firm, especially that connecting the lung to the diaphragm. The tissue of the lower lobe was solid, tough, and of a dark-grey colour; the bronchi greatly dilated, even to their ends. In the posterior portion was a well-lined cavity, of the size of a large egg, containing purulent fluid, and communicating by three round openings with dilated bronchi; a similar cavity at the base of this lobe. The middle lobe was very emphysematous and flaccid in front, but consolidated behind, and contained nodules of grey tubercle. In the upper lobe was a cavity of the size of an orange, with grey irregular walls, containing broken-down tubercle. The rest of the lung was in a state of grey consolidation, which in some parts had become yellow and softened. The large bronchi were very red.

In this case the contractile consolidation of the lung, resulting from inflammation twelve years before eventually went into tuberculous degeneration. This case occurred before the use of cod-liver oil was well known, and may be contrasted with the following examples.

Case 30.—A gentleman, aged 43, was seen by Dr. Williams for the first time on May 1st, 1855. Had been closely confined to business, but pretty well till February, 1855, when he was chilled, and a few days afterwards attacked with cough, shortness of breath, and then with severe pain in the loins and lower chest, and inability to lie on the left side. Expectoration has nearly ceased, but cough continues; breath is very short, and he looks miserably thin and pale, yet he is engaged to be married very shortly. The urine contains much brown sediment. Physical signs: Left side generally contracted, hard and dull; no breath-sounds audible in lower regions, but some below the clavicle; large tubular sounds and strong vocal vibration in middle regions; heart drawn up above fifth rib to the left. Has been taking citrate of iron and quinine. Ordered oil, in a tonic of nitric and hydrocyanic acids, with tinctures of hop and orange. An effervescing saline to be taken at night, and tincture of iodine to be applied to the chest.

July 7th. Has been taking oil three times a day, with acid and quinine, and is much improved in flesh and strength. Is free from cough, and expectorates but little; but still has pain in the left side. Physical signs slightly better, but still great contraction and dulness of this side. Ordered to take oil, with iodide of potassium, and to continue counter-irritation.

Dec. 29th. Was married in the middle of July, and has continued to improve, taking oil regularly, and gaining much in flesh, strength, and breath. Has had slight cough during the last ten days. Physical signs about the same.

May 26th, 1856. Had cold and cough for some weeks in the winter, and expectoration has continued since. Flesh and strength good, and breath better, though still short. Physical signs: Still dulness and collapse in left side of chest; but more vesicular breath in upper portion.

Oct. 23rd. 1862. Has been quite well, and has three children. Had lost cough, but breath remains short on exertion. Lately, at Scarborough, got chilled, and cough has returned, with yellow expectoration, and furred tongue. Physical signs:—Still defective motion and breath in left chest; obscure in back and side; tubular voice at and above the scapula. Heart adherent to chest; impulse strong, less from hypertrophy than from the closer contact even of the left ventricle with the chest wall.

This patient has not been since heard of, but is supposed to be living, although there was still the danger of the cacoplastic deposit in the left lung further degenerating, and passing into the phthisical course.

Case 31.—Mr. ——, aged thirty-nine. Grandmother died of phthisis.

September 19th, 1856. Two months ago, after much exertion, he had a fever which was called gastric, but it was accompanied with cough and expectoration, once bloody, and the cough has continued, with opaque sputa; and although he has regained some strength, he has not recovered flesh, and sweats much at night. Physical signs: Defective motion, and extensive hard dulness over the whole right chest—most in upper parts, where there are large loud tubular sounds, and strong vocal vibration. Some crepitus in the lower parts, but no vesicular breath-sound. He had been taking cod-liver oil, a dessert-spoonful twice a day; to be increased to a table-spoonful, and taken in infusion of orange peel with sulphuric acid.

October 13th. Cough less, and improved in strength. He passed the next winter at Rome, with little improvement, the emaciation, cough and expectoration continuing, and the state of the lung much the same—extensive consolidation, but no decided softening or excavation. The winter 1857—8 was spent at Nice, and during this year a gradual improvement took place in flesh; the patient gained nine pounds, and the cough and expectoration ceased. Physical signs: Still much dulness, and tubular sounds in right back and front, but more motion and breath.

Oct. 4th, 1859. Last winter in Rome, with more strength and activity. Is much less thin. Has been lately at Spa, and suffered from rheumatism of the back, and sweats. Physical signs: Motion and sound on percusssion much improved in right chest, but there are still some dulness and large tubular sounds at and above right scapula. To take mixture of iodide of potassium and quinine, with nitric acid.

December 6th, 1860. Has been generally well, except occasional pain in the right chest, and perspiration on exertion. Physical signs: Movement and stroke sound of the right side still not equal to those of the left, and some tubular sounds remain in the scapular region; but there is good vesicular breath sound elsewhere.

1866.—Quite well in health. Still some tubular sound and dulness in upper right.

1868—Continues well.

I apprehend that most practitioners in this country are agreed in considering that consumption should be generally treated on a tonic and sustaining plan; and that the nourishment and strength of the system should be supported by varied tonics and cod-liver oil, as well as by the most nutritive articles of diet. But when the disease is ushered in with symptoms of acute bronchitis or of pneumonia, with its attendant fever and scanty disordered secretions, it is obvious that such treatment is wholly unsuited for the occasion; and that remedies of the mild antiphlogistic kind, such as salines, with or without antimony, blisters, and cataplasms, and sometimes even moderate leeching or cupping, will give most relief, and will prepare the patient for the safe administration of the sustaining class of remedies.

The great remedy, more essential and more effectual than any other, is the cod-liver oil; and we may well bestow a little consideration on the mode of using it to the best advantage.

It is now pretty generally admitted by the profession that the pure, pale oil, simply extracted from the fresh, healthy livers of the fish, is that most suitable for the majority of patients, as being less unpalatable and at least as efficacious as the impure kinds. Since I first recommended this pure oil (*London Journal of Medicine*, January, 1849) it has been so extensively prepared and used that it is now one of the most important articles in the materia medica; and the universality of its introduction is a strong proof of its claim to public favour.

On the mode of operation of the oil, and on the best methods of administering it, I have little to add to what I have published twelve years ago ("Principles of Medicine," 3rd edit., p. 487). To that I must refer for details which would be too long for quotation here; but I may give the following brief summary of my opinions and experience on the subject.

Cod-liver oil, when taken into the system in sufficient quantities, and for a sufficient length of time, acts as a nutrient, not only adding to the fat of the body, but also promoting the healthy growth of other tissues, and in some way, as an alterative, counteracting the morbid tendency to the proliferation of the decaying cells of pus, tubercle, and kindred cacoplastic and aplastic matters.

That its efficacy depends much on its being absorbed freely into the blood, and through the circulation pervading all parts of the body, and thus reaching to the very seat of morbid deposits and formations.

That the more fluid part of cod-liver oil surpasses all other oils and fats in the facility with which it forms emulsions, which are tolerated by the stomach and readily absorbed into the blood, without causing the nausea and bilious derangement that commonly result from an excess of fat food. This peculiarity may depend on the biliary and other matters contained in the oil, which in other instances of disease is found to act beneficially on the liver and other secreting organs.

That the best time for the administration of the oil is immediately after, or, to those who prefer it, at or before, a solid meal, with the constitutents of which the oil becomes so intimately blended that it forms a part of the chymous mass, and is less likely to rise by eructation than when the oil is taken into an empty stomach. From this chymous mass, the oil being absorbed through the lacteals with the chyle, is less apt to disorder the liver than if absorbed through the veins of an empty stomach.

That as the use of the oil should be continued for a long time—perhaps for months, or even years—it is of great importance to conciliate both the palate and the stomach by giving it in a vehicle which may agreeably disguise its flavour and strengthen the stomach to bear it. For this purpose an aromatic bitter, such as the compound infusion of orange-peel, acidulated with a mineral acid, both to help to cover the taste of the oil and also to suit the stomach, which should be duly supplied with acid during digestion, generally answers well. Syrup may be added according to the taste of the patient ; or, still better, some bitter tincture, such as calumba, cascarilla, or quinine, in every case in which it is desirable to improve appetite and tone. In cases of peculiar weakness of stomach, with tendency to retching or nausea, strychnia, in a dose of from $\frac{1}{32}$ to $\frac{1}{24}$ of a grain, proves a most valuable adjunct to the vehicle. By its means I frequently overcome the fastidiousness of stomach arising from debility, hysteria, or indulgence in alcoholic liquors. Salicine is another efficacious alternative of the same kind. Either of these, although a powerful tonic, has none of the heating properties of quinine or iron. When the strong bitter taste is objected to, a pill, containing extract of hop or chamomile, or salicine, or quinine, may be taken after, or before, the oil and its vehicle.

The bulk of the whole dose of oil and vehicle should be small, so that it may be swallowed at a single draught; therefore the vehicle should not exceed a tablespoonful, with, at first, a teaspoonful of oil, to be gradually increased to a tablespoonful. The dose of oil should rarely exceed a tablespoonful twice or thrice daily: when a larger amount is taken at a time, generally either it deranges the stomach or liver or some of it passes unabsorbed by the bowels.

The acid may be varied according to circumstances. The nitric generally suits best in inflammatory cases, and those attended with much lithic deposit in the urine; but its tendency to injure the teeth is an objection to its long continuance. The sulphuric is more eligible where there is liability to hæmoptysis, profuse sweats, or diarrhœa. But in most cases, and for long continuance, I have found reason to prefer the diluted phosphoric acid, which may be termed the most physiological of the acids, tending to derange the chemistry of the body less than the others.

With some individuals the oil agrees so well, and so much improves their digestive powers, that they require few or no restrictions in diet; but this is not the case with the majority. The richness of the oil does prove more or less a trial, sooner or later, to most persons; and to diminish this trial as much as possible, it obviously becomes proper to omit or reduce all other rich and greasy articles of food. All pastry, fat meat, rich stuffing, and the like, should be avoided; and great moderation observed in the use of butter, cream, and very sweet things. Even new milk in any quantity is not generally borne well during a course of oil; and many find malt liquor too heavy, increasing the tendency to bilious attacks A plain nutritious diet of bread, fresh meat, poultry, game, with a fair proportion of vegetables, and a little fruit, and only a moderate quantity of liquid at the earlier meals, commonly agrees best, and facilitates the continued exhibition of the oil in doses sufficient to produce its salutary influence in the system.

In case of a bilious attack coming on, indicated by nausea, headache, furred tongue, offensive eructations, high-coloured urine, and sometimes pain and tenderness of the right hypochondrium, it is necessary to suspend the oil, lighten the diet of the patient, and give blue pill or calomel with an aperient on alternate nights, and an effervescing saline two or three times during the day. A few days of this treatment will generally set the stomach and liver to rights, and the oil may be resumed, beginning with small doses as at first. In all cases during the use of the oil the bowels should be kept regular in action; and if this cannot be done by regularity of habit and diet, it should be effected by the use of a mild daily pill of rhubarb or aloes.

Such are the directions which have proved most effectual in the administration of a remedy which may truly be said to have so much altered the prospects of the consumptive as to give hope of cure in not a few, and of much prolonging life in by far the greater number. But to induce patients to follow these directions, and to overcome their aversion to a remedy which the prejudice of some represents as disgusting, and the experience of many may find trying to continue for so long,—the practitioner will often find it necessary to use all his powers of argument and persuasion. The great plurality of patients are amenable to reason, and are willing to follow any advice that is given with *confidence* and *clearness.* To those who demur or rebel it is generally expedient to tell the plain truth—that they have a serious disease, pretty sure to increase, and sooner or later to destroy life, if left to itself; but *here is the remedy*—the only one worthy of the name, which if carefully and faithfully used may arrest and cure the disease, and is pretty sure to retard it and prolong life more than any other known means. If the physician believes this himself he will rarely fail to carry his patients with him. I believe it firmly, and I rarely fail to make the patient take the oil, and to persevere with it, in the experience and conviction that it is essential to his well-being and improvement. The proportion of recusants, either from waywardness of temper, fastidiousness of taste, or from intolerance of stomach, altogether does not exceed five per cent.

Although my long experience assigns to cod-liver oil a place far above all other remedies in the treatment of pulmonary consumption and its allied maladies, it has taught me to believe also in the limited efficacy of certain other agents.

[Before the introduction of cod-liver oil a combination of iodide of potassium and nitric acid, with a vegetable tonic, was frequently prescribed in consumptive cases, and was productive of some good. This Dr. Williams still uses in the rare cases in which the oil disagrees. The hyposulphites of soda and lime, so strongly recommended by Dr. Churchill of Paris, has in the author's hands proved decidedly beneficial in certain cases. These hyposulphites seem to increase the failing powers of respiration and circulation.]

Perhaps the efficacy of the sulphurous acid—Dr. Dewar's remedy for consumption—may depend on an influence not altogether unlike that of the hypophosphites. My experience of the use of the spray of sulphurous acid is limited in phthisis, and as far as it has gone has not been very encouraging. But I have found the spray a most useful and agreeable remedy in various affections of the throat, whether diphtheritic or aphthous; and it has proved cleansing and soothing in some cases of foul ulceration of the throat, affecting both larynx and fauces, generally syphilitic in origin, and sometimes ending in pulmonary consumption.

In connexion with this subject, I most notice remedies administered by inhalation, which are really useful in certain cases, chiefly those in which the larynx and trachea are much affected, and in those attended with convulsive cough or offensive expectoration. I have generally found the use of inhaling instruments fatiguing and unnecessary. A quart jug of hot water, with a napkin from over the nose down to and around the jug to confine the steam, is all that is needed. To the hot water is added the drug to be inhaled; and creasote or carbolic acid, iodine, chloroform, oil of turpentine, and juice or extract of hemlock, are the articles which I have found most beneficial. A few drops of one, or of several of these combined being put into the hot water, the inhalation is practised through both mouth and nostrils without restraint or difficulty, and may be continued for five or ten minutes every night, and, if need be, repeated once or twice in the day. Although the chief operation of this medicated vapour is on the guttural and bronchial surface, yet a portion penetrates into the lungs, and is absorbed into the system; for iodine and oil of turpentine can be detected in the urine within a few minutes of the inhalation being made. Still, although proving very serviceable in certain cases, I cannot rank inhalation higher than as a subordinate remedy in the treatment of consumption. I may add, that the practice of painting the chest with tincture of iodine every night, as a gentle counter-irritant, is not without a certain influence in the way of inhalation; for a portion of the iodine evaporates, and slightly impregnates the air around the patient, and this atmosphere of iodine may not be without its influence for good.

Of far more importance in the treatmant of consumption is change of air and climate It is of the greatest consequence to the phthisical invalid that he should breathe as pure air as possible, and that the influence of this pure air on the blood and on the body should be increased by such gentle and varied exercise in it as his strength and the condition of his organs will permit. This is the great object of our sending him to a warm climate in winter, and to a high and dry locality in the summer, that he may be as much as possible in the *open air*, with its exhilarating and vivifying accessories of light, purity, and freshness, without the chilling operation of cold and wet in the winter, and the enervating and exhausting influence of oppressive heat in the summer.

In conclusion, I trust that the preceding paper has proved that, powerless as medicine is in the overwhelming and rapid types of pulmonary consumption, it has yet considerable influence over the milder forms; and *that under careful treatment life may be prolonged for many years in comfort and usefulness, and in not very few cases the disease is so permanently arrested that it may be called* CURED.—*Lancet, July* 4, *and August* 15, 1868, *pp.* 3, 211.

28.—MORBID CONDITIONS OF THE THROAT IN RELATION TO PULMONARY CONSUMPTION.

By Dr. S. SCOTT ALISON, Physician to the Hospital for Consumption and Diseases of the Chest, Brompton.

[The relations which have been held to subsist between disorders of the trachea and adjacent parts, and pulmonary consumption, are four in number—1. That of a precursor; 2. That of a coincident; 3. That of a sequela; and 4. That of a simulator.]

In the first stage of phthisis the non-implication of the trachea and adjacent parts is most common, and even in such cases a majority will show a not entirely healthy condition of the parts in question. In the second stage a much larger proportion of cases is found to be implicated with these minor affections; and in the third, nearly every case reveals, either by the voice or by respiratory auscultatory signs, evidence of the implication of the windpipe. The task of connecting the disorder of the trachea with the more grave disease of the lung in such cases is, on the whole, an easy one. If there be any difficulty it is in cases of phthisis in its first stage. The aberrations from the healthy amount and quality of the respiration sounds of the chest, serve at once, in the later stages of pulmonary consumption, to indicate the dependence of the minor disorders upon pulmonary mischief.

Of twenty-six cases of all forms of phthisis in all stages of the disease now in the hospital at Brompton, under my care, nineteen, or 73 per cent., give full evidence of disorder of the upper air-tube apparatus.

Some of the local complications are grave, whilst others are of less serious significance.

Of eighteen cases of phthisis in the third stage, only three are free from implication of the trachea, and other parts of the upper air-tube apparatus. These figures give a percentage of 83.

The diseases of the trachea, larynx, and adjoining parts, which we observe in pulmonary consumption, are almost invariably found to hold this relation, viz.—that of sequela. In examples of acute pulmonary consumption, it is consistent with my observation to say, that the disorders of the windpipe, &c., that occur, depend upon the extension to the parts first involved, of that tubercular vascular over-action which originated in the lungs. This morbid action is propagated by continuity of structures.

In chronic cases of phthisis, the disorders of the trachea, larynx, and adjoining parts, seem to proceed from the production of congestive action from neighbouring irritative disease, and in the second and third stages from inflammatory conditions, sometimes simple and sometimes tubercular, caused by the actual passage of irritant secretions, and the *debris* of destroyed material from the diseased lung, over hitherto healthy parts.

The morbid alterations of structure which I have observed in the trachea and the adjacent parts, in pulmonary consumption, are various. These conditions are often simply an injected and turgid, and somewhat swollen state of the mucous membrane of the rima of the glottis, the epiglottis, the tonsils, and the posterior wall of the pharynx, and of the larynx and trachea. These parts may be all equally affected, but it is more frequently the case that only some parts are materially involved. In the more advanced cases of phthisis the larynx and trachea are chiefly diseased, but in many examples, rapidly progressing to a fatal issue, all parts are implicated. Red and injected conditions, with small elevations of swollen glandules of the posterior wall of the pharynx are common. Indented or serrated conditions of the epiglottis are often presented, and a thin and shaven-off like edging is not unfrequent. A red and scarlet state of the epiglottis, resembling the petal of a scarlet geranium, is often met with. The larynx is often inflamed, congested, ulcerated, and totally, or almost totally, deprived of its vocal cords. A very general condition, in extremely bad cases, is one of total loss of the cords, with deep ulceration between the thyroid and cricoid cartilages, and a general ulceration, and rough or granulated surface of the entire mucous membrane of the larynx.

The symptoms during life attending the allied disease of the trachea, &c., are, in slight cases, huskiness and occasional hoarseness, sense of irritation in the throat, and more or less frequent attempts to clear the parts of mucus, producing a sound like the word "hem," more or less forcibly formed. The hoarseness frequently becomes continuous, and when ulceration of the larynx is extensive, aphonia or whispering is produced. When the vocal cords are totally destroyed, the aphonia is complete, and the attempt to speak simply produces a roaring and inarticulate sound, very painful to hear. In these latter cases deglutition is painful, and when the epiglottis is greatly ulcerated, particles of food are wont to fall into the larynx and to give rise to partial suffocation, and to severe local convulsive efforts.

An œdematous state of the rima glottidis is occasionally found in the last stages of pulmonary consumption, and this gives rise to great difficulty of respiration. The lung is not duly inflated, and it is impeded in the expulsion of its æriform contents. The voice is destroyed, or becomes whispering, and the sound of respiration, heard through the medium of the open atmosphere, or through the stethoscope placed upon the neck, is hissing and constricted. The greater intensity of the hissing or constriction at the immediate region of the glottis, points to the seat of the constrictive disease.

Tubercular matter, grouped in masses even so small as mustard seeds, I have never seen in the larynx and trachea, and this product seems, when deposited, to affect very fine forms, scarcely visible to the naked eye, such as I have observed in the aorta and pulmonary artery. The distinct masses of tubercle which we find embedded in the mucous membrane of the bowels, both small and large, I have never seen imitated in the mucous membrane of the tubular apparatus leading to the lungs. The addition of important throat affections to pulmonary consumption adds seldom to the danger of the patient, but exposes him to grave inconvenience. Difficulty of swallowing tends to hasten dissolution.

The discovery of even advanced disease of the lung is in some cases impeded by the presence of strongly marked signs of disorder of the trachea, &c. The coarse and loud constrictive respiration sound through the upper portion of the air-tube apparatus, tends by descending into the lung structure to mask fine and single humid crackles in cavernules and in cavities. The cavernous voice is with some difficulty made out in cases marked by partial aphonia, and weak and whispered voice. The articulated voice, superficial and very near, so valuable as a sign of cavity is, of course, lost in cases of aphonia. I have seen several cavity cases in which, even after very diligent exploration, I have been left in doubt until a second examination has been made. The proportion of such cases is small, for careful listening will generally detect some amount of crackling, either cavernulous or cavernous, and the voice over the diseased lung will generally show an unusual amount of distinctness and nearness. Besides in advanced softening and in cavity cases, the motion is reduced, and the percussion is either dull or of manifestly short duration. Coughing will sometimes give the requisite evidence. In cases of tubercular perforation of the pleura, the amphoric respiration and voice, and the clear percussion at first thoughout the diseased side, and in the stage of effusion the clear percussion above, and the absolutely dull percussion below will almost always suffice to lend certainty to the judgment.

It is right, however, to mention that cases of cavity do sometimes present themselves in which the cavity has been altogether overlooked when such oversight is scarcely to be justified, and this has happened from the marked character of the throat complication causing the chest to be exempted from all exploration. Since very much attention has been given to the laryngoscope, and so much time expended upon its use, these-overlookings seem to have become more than usually frequent. Perhaps this is in some measure to be explained by the fact that the laryngoscope has been largely adopted, and most usefully too, by some members of the profession, who had not previously seen much disease of the chest, or been familiar with the methods of exploration of that portion of the body. Such oversights are not only an injustice to the patient, but discredit the medical attendant, and are likely to prove injurious to him. To avoid all chance of such results it should be made a rule that, in cases of throat disease of any importance, either through the urgency or intractability of local symptoms, or suffering of the general health, the entire chest should be subjected to the tests of expansion, percussion, and auscultation, I would almost say of *differential* auscultation. With this chest examination such errors will not often occur, and should disease subsequently manifest itself, it will be felt that non-discovery did not rest upon culpable neglect.—*Medical Press and Circular, July* 1, 1868, *p.* 3.

29.—TREATMENT OF HÆMOPTYSIS BY ERGOT OF RYE.

By Dr. Horace Dobell, Senior Physician to the Royal Hospital for Diseases of the Chest, &c.

[Dr. Dobell considers that he has been very successful in the treatment of hæmoptysis arising from tuberculous disease of the lungs.]

I attribute the success of my practice in this respect mainly to the use of ergot of rye; because it is quite true, as already suggested, that, in nearly every consultation case of appalling hæmoptysis that I have seen, "everything has been done, and every remedy tried," with the one exception of ergot of rye; and the use of this remedy has generally turned the fate of the patient. It has always struck me as a singular fact, that general practitioners, who are so well acquainted with the effects of ergot in uterine hemorrhage—who use it more frequently than any other class of practitioners—with whom in fact it is almost a "pocket-companion"—never seem to think of using it in pulmonary hemorrhage. I find, from frequent inquiry of my medical friends, that this is explained by the prevalence of the idea that ergot only acts by inducing contractions of the muscular tissue of the uterus; its remarkable power of inducing contraction of the blood-vessels being lost sight of. This is so generally the case, that I never met with but one general practitioner in the London district (in the country it seems to be better known) who was at all aware of the power of ergot to control hæmoptysis. This exception was Dr. Betts, formerly of Highgate, now of Ventnor, who has as much confidence in the remedy as I have myself, and dates his confidence from the occurrence that, when a student at Guy's Hospital many years ago, suffering from profuse and intractable pulmonary hemorrhage, under the care of the late Dr. Addison, his case was on the point of being given up as hopeless, when the bleeding was suddenly brought to a standstill by a large dose of ergot, administered at his own request; the idea having occurred to him, that, as it so often arrested uterine hemorrhage, it might also answer in hæmoptysis.

But I have said that, in the appalling cases to which I have referred, "everything else had been done, and every remedy tried," before I ordered ergot; and I desire to attach the greatest importance to this fact. Ergot is only competent to do one of the many things necessary to stop a severe pulmonary hemorrhage; viz., to contract the vessels. It is necessary to do much more than this.

1. The vital power must be supported by brandy, iced milk, and beef-tea, if indicated by the general symptoms.

2. The heart must be kept steady by digitalis.

3. Congestion must be relieved by saline purging.

4. Clotting of the blood must be promoted by styptics, and by the free admission of cold air.

5. The bleeding part must be kept at rest by position, by enforced silence, and by soothing the cough.

In spite, therefore of the fashionable outcry against complicated prescriptions, I venture to give the following as the most efficacious, and, as it seems to me, the most rational, combination of remedies for a case of profuse tubercular pulmonary hemorrhage. It has served me many a good turn, and I hope it may do the same for my professional brethren.

℞. Ext. ergotæ liq. ʒij (to contract the vessels); tincturæ digitalis ʒij (to steady the heart); acidi gallici ʒj (to clot the blood); magn. sulphatis ʒvj (to relieve congestion); acidi sulphurici diluti ʒj (to assist the rest); infusi rosæ acidi ad ℥viij (to make a mixture). A sixth part every three hours till hemorrhage is arrested.

In any given case, either of the ingredients may be omitted, if the symptoms indicate that it is not required, or that it has already done its duty.—*British Med. Journal, June* 27, 1868, p. 631.

30.—ON THE INFLUENCE OF A DIGESTIVE HABIT IN THE PRODUCTION OF TUBERCULOSIS.

By Dr. David J. Brakenridge, of Edinburgh.

Notwithstanding the great advance that has of late years been made in our knowledge of tuberculosis, it is difficult to connect into one consistent whole the opinions entertained regarding the origin, nature, and treatment of this malady. The profession in this country is much indebted to Dr. J. Hughes Bennett for those views regarding the essential nature of the disease which he has so perseveringly and successfully urged upon its attention. They are much strengthened by the great success of that treatment which he has founded upon them, and many authorities are now amongst the number of those who believe that the immediate cause of tuberculosis is a deficiency in the chyle of those oily matters which, together with albumen, are essential to the formation of a true nutritive blastema. Most physicians, if they do not go so far, are at least of opinion that deficiency of fats is, in some manner or other, at the root of this condition, and that in the means of supplying that deficiency lies their hope of its successful treatment. In the great majority of cases there is a marked dislike of, and want of power to digest, fats, and every effort is made by tonics and other means to overcome this dislike; too often in vain, or with only partial success. Fortunately, in cod-liver oil and the pancreatic emulsion we have this important constituent of food in forms which are easily digested; so that a certain number of patients who have lost the power of ordinary fat-digestion, being able to digest these simple forms, are checked in their downward progress, and have, perhaps, the full power to elaborate the higher fats ultimately restored. But even with these powerful remedies in our hands the cases in which our oils disagree are not unfrequent, and the numbers still carried off annually by this scourge are very great.

In the following remarks I shall endeavour to show that by teaching our patients to flee the winter's cold and court a perpetual summer we are refusing to them the best tonic to fat digestion which nature's generous pharmacopœia offers to our choice, and that, with our cod-liver oil and pancreatic emulsion in our hands, we ought rather to give them the benefit of a continued, but not too severe, winter temperature. Thus we might hope to restore the lost function and re-establish the normal and habitual digestion of oils. Several observing physicians mention, almost with surprise, that many of their patients in the earlier stages of the disease have seemed to derive benefit from a low temperature and to suffer during summer heat. It would be more surprising were the reverse true, for warmth, lessening the oxidation of, and consequent demand for, fats, hastens the establishment of that morbid refusal of them on the part of the digestive organs on which the disease depends; whereas, on the other hand, a cold temperature, by increasing the combustion of fat, gradually rouses the digestive organs to an effort to meet the extra demand. It is in this direction only that we can hope to correct this morbid digestive habit and restore the normal function.

Without entering into the whole subject of tuberculosis, I shall endeavour under the following heads to explain my views more particularly :—

1. The digestion and non-digestion of different kinds of food may and do become habitual.

2. The condition of body favouring the development of tuberculosis is a habit of non-digestion of fat.

3. The causes of this habit are such conditions as diminish the consumption of, and consequent demand for fat in the system—*e.g.*, warmth, impure air, want of exercise, &c.

4. In the treatment of this condition the indications are to break this habit, and to restore the lost power of digestion of oils.

5. This will be best done by supplying in increased force what we find to be the chief stimulants to the digestion of fat—*e.g.*, cold, pure air, exercise, &c.—and by avoiding all that would tend to confirm the bad habit.

6. Summer is therefore more to be dreaded than winter in the tubercular diathesis, and safety to be sought rather in choosing a cool bracing climate in the former season, than in the opposite and usual course.

1. *The digestion and non-digestion of different kinds of food may and do become habitual.*—Habit is, according to Dr. Johnson, "a power or ability of doing anything acquired by frequent doing the same thing," and as no acts are performed more regular than those of digestion, it does not seem unreasonable to extend the application of the law of habit to them. The nervous centres presiding over the process of digestion must, like other nervous centres, become educated by being repeatedly exercised in certain directions, and such powers as are the result of this process of education by frequent repetition we are justified in calling habits. But it is not to the nervous centres alone that we must look for an explanation of these. As the different constituents of our food are operated upon by the

secretions of different organs, the functional activity of those which have been most used in digestion will be greatest. Hence, most gastric juice will be secreted by the hunting tribes who consume large quantities of flesh; most saliva by the inhabitants of warm countries, a great proportion of whose food is starch; and most bile and pancreatic juice by the fat-digesters of the Arctic regions. These considerations taken together explain what we here mean by habit. We shall find that these habits are governed by every variety of circumstance. In no two places, perhaps in no two individuals, are they exactly alike; but the most striking differences are to be met with in those who live under the most opposite conditions. Each nation has a dietary, more or less peculiarly its own, originating in the demands set up in the system by permanent surrounding agencies, and modified from period to period by the customs of the people and the alimentary resources of the country. The food of each country is preferred and most easily digested by its own inhabitants; on the other hand, disturbance of the digestive organs is usually the result of a change of country and diet. This holds true with regard to comparatively slight as well as to great changes. For illustrations of great difference in diet let us take the two following:—We have the Esquimaux habitually consuming large quantities of fat, and showing a great dislike for starchy food—a typical digester of fats and non-digester of starch; and, on the other hand, we have the Hindoo living on rice and avoiding the rich hydrocarbons—an habitual non-digester of fats and digester of starch. In these, as in all other cases, we see that the desire for, and digestion of, different kinds of food are evidently regulated by surrounding agencies, operating through their influence on the chemical changes taking place in the body. But this is not all; for when a particular dietary has been called for and kept up for a considerable time, the functions of the digestive organs become so adapted to it, that, when the conditions giving rise to the necessity for it no longer exist, it continues to be desired and digested. Cases will occur to every one in which Esquimaux or Russians, &c., on going to a warmer climate, have continued to consume and digest unnecessarily large quantities of fatty substances, and have thus suffered greatly from the heat; and we have, on the other hand, the experience of our Arctic explorers, showing that many months have elapsed before such food as seal's liver and walrus blubber have become desirable, although they were from the first, as much as ever, demanded by the severity of the climate. The bilious attacks of Europeans on first visiting the tropics result from the still unbroken habit of fat-digestion; and the phthisis from which negroes and monkeys suffer on going to a colder climate, is attributable to their habitual non-digestion of fat. Most national digestive habits are probably the result of special conditions operating for generations, and consequently, where the change is extreme, acclimatisation has been pronounced impossible, so difficult is it to break these habits. Individual habits, which are of shorter duration, may be more successfully combated. Hence the stubbornness of hereditary disease compared with the same when acquired.

2. *The condition of body favouring the development of tuberculosis is a habit of non-digestion of fat.*—By this I mean a comparative, not a complete, non-digestion. There is abundant evidence to show that in tuberculosis fat-digestion is defective. Almost all writers insist upon the repugnance felt in most cases for fat; and even where this dislike is not present, and considerable quantities are taken, it is usually met with in the stools, showing that it is not digested. There is, therefore, every reason to believe that this diseased condition depends upon a deficiency of oil, and consequent relative excess of albumen in the nutritive fluid. Admitting this, the question still remains—How does this disproportion between these substances originate? To this no satisfactory answer has as yet been given. To say that it is due to acidity of the alimentary canal does not indicate where or how the departure from the normal condition begins. Acidity is only one of the events in the history of the disease, and may be traced to that general suboxidation which accompanies diminished vitality. Most probably it is to be met with in all cases of tuberculosis which get the length of a *post-mortem;* but there is no reason to believe that it is the essential beginning of the tendency to the disease. Preceding the deposit of tubercle there is a stage in which deficient energy is the most marked feature, and wherein no actual disease of any kind can be traced. But even here the deficient digestion of fat has become established, only enough being taken into the system to supply the waste of tissue. Such being the case, it only requires some little additional demand to be made upon this small stock of fat to cause actual disease, with deposit of tubercle to commence. Repeated or prolonged exposure to unusual cold is sufficient, by drawing up the limited supply of carbon, to disturb the balance between the fat and albumen, and thus cause mal-nutrition, with deposit of tubercle, particularly in those organs which are most active during the operation of the exciting cause.

The harmony which will be seen to exist between the recognised causes of tuberculosis and the conditions which favour the non-digestion of fats will most of all support this view.

3. *The causes of this habit are such conditions as diminish the consumption of, and consequent demand for, fat in the system.*—

The appetite for, and digestion of, fat are originally regulated by the amount of its combustion in the body. Hence the causes of its habitual non-digestion will be those conditions which diminish that combustion. These may be pretty accurately ascertained by the amount of carbonic acid given off by the lungs under different circumstances.

(*a*) The temperature of the surrounding medium has a great effect on the amount of carbonic acid thus exhaled, heat diminishing and cold increasing the quantity. Hence cold climates and the winter season, by favouring the combustion of carbon, increase the desire for fat in the food. Warm climates and the summer season, on the other hand, are opposed to fat-digestion. Warmth applied from without in any other way will have the same effect; therefore warm clothing, confinement to warm rooms, the exclusive or excessive use of warm drinks, &c., will tend to establish this habit of deficient fat-digestion.

(*b*) Clothing has, as we have said, an effect similar to that of increased temperature, but differing in that it checks free perspiration. The non-conducting and close skins worn by the Esquimaux and other northern tribes must therefore greatly conserve the heat, and aid their increased carbon-combustion in resisting the influence of the excessive cold; whereas, on the other hand, the thinnest clothing must be very injurious in hot climates. Dr. Livingstone found by experiment that the temperature of the almost naked African was two degrees lower than his own.

(*c*) Other conditions being the same, increased density of the atmosphere diminishes, and lessened density increases, the activity of the chemical changes dependent on respiration; consequently in warm climates high altitudes are found to be beneficial to the consumptive, because they are more favourable to fat-digestion than lower-lying places.

(*d*) A moist state of the atmosphere promotes, and a dry state checks, the exhalation of carbonic acid; but the former checks, and the latter promotes perspiration. Thus, under the influence of moisture, heat is both formed and retained in the body to a greater extent than is required by the surrounding temperature. Hence a feverish state is induced which is antagonistic to fat-digestion; and as excretion from the skin is checked, and exhalation of carbonic acid is increased, extra work is thrown upon the lung, so that moisture may, by these combined actions, become an exciting cause of phthisis pulmonalis where the predisposing habit already exists. Dry hot air is, therefore, more easily borne than moist, and the advantage of a dry climate such as Egypt may depend upon the diminished heat of body from lessened oxidation and increased perspiration.

(e) Sleep and waking have a most important influence on oxidation. Professor Pettenkofer has quite lately shown most conclusively "that large quantities of carbonic acid are produced during the day in waking, whether we work or not, and that the absorption of oxygen during the day is comparatively trifling; while at night, during sleep, large quantities of oxygen are absorbed and stored up in the system, in order to enable us to compensate the previous extra waste of oxygen, and to be again prepared on the day following for the requirements of waking life." (See Medical Times and Gazette, 1866 and 1867.) According to his experiments, oxidation would appear to be a much less simple process than hitherto supposed, and the oxygen is probably occupied in various stages of oxidation within the system before the ultimate products of combustion—viz., carbonic acid and water—are formed. These experiments accord perfectly with, and therefore derive support from, those previously made on animals during hybernation. Certainly the above conclusions throw great light upon the habitual non-digestion of fat as a cause of phthisis, for in this disease no conditions are more constant in their operation than those to which we are subjected while sleeping. However varied eur occupations and surroundings may be during the day, night after night we are under almost the same influences. The importance of close sleeping apartments in the production of phthsis has long been recognised; and, looked at in the light of these investigations, it cannot well be over-estimated. Amongst the poor of our large towns this cause must operate most powerfully; for, in addition to the numbers usually crowded into each room and closet, in winter every means is taken, on account of the scarcity of fuel, to prevent the free access of air. In the better classes closely curtained beds, and heated bedrooms during the cold season, have a somewhat similar effect, and the little inhabitants of the nursery, who, proportionately to weight, should absorb very much more oxygen than adults, are often crowded into an ordinary sleeping apartment, with the addition of nurses, and not unfrequently one room serves the double purpose of night and day nursery. Here, therefore, in both classes we have a constant source of deficiency of oxygen in the blood, and consequently of lessened demand for fat in the food. These experiments of Pettenkofer throw much light upon the large amount of carbonic acid given off, according to Dr. Edward Smith, during the early hours of the day, and the diminishing exhalation in the evening.

(f) Impure air was believed by Baudelocque to be the true and probably the sole cause of phthisis; and experiment has shown that relative purity or impurity of the air affects the amount of carbonic acid given off by the lungs considerably. Thus,

if any amount of carbonic acid was present in the air, the quantity exhaled was lessened. When 300 cubic inches of air were repeatedly breathed for three minutes, only 9·5 per cent., or 28·5 cubic inches in all, were given off, although, when fresh air was breathed at every inspiration, the amount exhaled was 32 cubic inches per minute. In badly ventilated rooms, therefore, a deficiency of oxygen operates at night, and an excess of carbonic acid during the day, in the establishment of a lessened demand for fats.

(*g*) Muscular exertion increases the quantity of carbonic acid exhaled, both during its continuance and for some time afterwards. But exercise is principally a cause of the digestion of albumen; for great muscular exertion causes the albuminous compounds to be broken up, force and heat being the result. Thus, to a certain extent, the necessity for highly carbonaceous substances is diminished. Hence we find that in training fat is avoided. When training is suddenly left off, the habitual non-digestion of fat being thus more or less established, and the amount of albumen decomposed in the system being insufficient to keep up the heat of the body, the balance is apt to be disturbed, and tubercle deposited. Hence many athletes die of phthisis.

(*h*) The quality and quantity of the food supplied must directly influence the exhalation of carbonic acid and the habits of digestion. The scarcity and high price of good milk, butter, eggs, and fat butchers' meat in large towns has much to do with the development of the habitual non-digestion of fats in early life, and the much greater tendency to phthisis in town than in rural populations must owe its origin to this cause amongst others, especially when taken in connexion with insufficient clothing.

(*i*) The depressing passions and great mental exertion have both the effect of diminishing the amount of carbonic acid exhaled, probably by lessening the number of pulsations and respirations.

We have thus briefly reviewed the conditions which chiefly influence the oxidation of carbon in the body, and which either lessen or increase the demand for fatty substances in the food. It must strike every one that those which lessen the exhalation of carbonic acid are exactly those which, when operating for a length of time, are recognised as the chief causes of tuberculosis. But, as fat-digestion is admitted to be dependent upon the combustion of carbon in the body, it may naturally be asked, Is not deficient oxidation the first link in the chain of causation? I think not, for it seems probable that, to the extent that there is fat in the fluids of the body to be oxidised, the system will respond to the demands made upon it by external conditions, and that in this readiness to be influenced by those agencies which promote the oxidation of carbon, we have the explanation of the mode in which the exciting causes of the disease act. Suppose, for example, that, in a certain man, through the long-continued influence of heat, the power to digest fat has become lessened : let this man now be at once exposed to the the influence of continued cold, and no reserve of fat being habitually supplied for the purpose of keeping up the heat of the body under such a temperature, that which is intended for tissue-formation is drawn upon, and deficient tissue renewal is the result. That the faulty action is to be looked for in the digestive organs may be further inferred from the fact that, when we get cod-liver oil to pass into the system, oxidation seems to proceed perfectly. Admitting, then, that the digestive organs are at fault, I think that the explanation here given is more satisfactory than any other.

4. *In the treatment of this condition the indications are to break this habit and restore the lost power of digestion of oils.*—We have seen that there is every reason to believe that the condition which really favours the development of tubercle is a habit of digestion, and we have examined one by one the various external influences to the continued operation of which its formation must be attributed. In seeking to effect a cure in the early and remediable stages of the disorder, it will therefore be our endeavour to correct this habit.

5. *This is to be best done by supplying in increased force what we find to be the chief stimulants to the digestion of fat.*—Having already considered in detail what these are, we shall avoid doing so again. Our success in the treatment will depend on our bringing into operation in each case a suitable combination of these conditions. In all cases the food is the chief thing to be attended to. The importance of this has long been recognised, and the matter of late years successfully studied. The result is that we are in possession of the two very easily digested substances, cod-liver oil and the pancreatic emulsion. These will pass into the system under many unfavourable circumstances, but, for reasons stated at the outset, they are not nearly so useful as they might be were they given under such circumstances as would operate powerfully in causing a demand for them in the system.

It is the fact that we possess fatty substances which will so readily pass into the blood, which makes us hope most from that treatment which we propose. If we had not the assistance of these first steps in fatty food, we might have some hesitation in urging these doctrines so strongly, as there might be some risk during the period which would elapse before ordinary fats could be digested. But in favour of cod-liver oil there is much to be said. When we have the first indications of tuberculosis presented to us, a certain amount of tubercular exudation has usually already taken place, and in our endeavour to cure the disease we have two indications to fulfil. First, in order to restore weakened tissue and prevent its further destruction, a properly constituted molecular fluid must be supplied to the blood. This will not, however, of itself suffice to remove previous exudation. Now we know, from their effects on enlarged scrofulous glands, that bromine and iodine both promote absorption of the exudation to a certain extent, even when given in our clumsy formulæ. The second indication, then, being the removal of this exudation, we have in cod-liver oil, ready-made by a living animal organism, a combination of these medicinal substances with an easily digested oil most suitable for application to a living structure. Thus, in administering cod-liver oil we with one substance fulfil both indications. Moreover, by having our medicines organically united with the reparative fluid, we insure their reaching and being brought into the most intimate relationship with the weakened tissues in the process of their renewal. Their operation being thus inseparably connected with the vital changes in the diseased parts, we can readily understand how small doses of these agents will, in this way, act much more powerfully than much larger quantities of the same substances administered in forms which have no affinity to the diseased structures. I should not class the pancreatic emulsion along with cod-liver oil, as, although both are easily digested, they are opposed to each other in their effects, the former being merely palliative, while the latter is truly curative. The emulsion, by supplying along with the fat the secretion which should digest it, removes the natural stimulus to the restoration of that secretion. Administered with the cod oil, and gradually giving place to the latter, its use may be attended with benefit at the commencement of that stimulating treatment which I recommend, by supplying the body from the first with a sufficiency of carbon, and thus preventing any risk that might attend the change from a warmer to a colder climate with increased oxidation.

To remedy defective nutrition by getting oil into the system, and to restore to the digestive organs the power of doing so habitually, being our aim, all other questions will be measured by their bearing upon this. With a view to this end the question of climate is of paramount interest. The climate of any locality is, for our present purpose, a combination in its atmosphere of certain conditions influencing the oxidation of carbon in the body. A favourable combination is to be met with only in certain places, and cannot be created at will elsewhere; whereas all other conditions having a similar influence may be supplemented anywhere. Thus a particular temperature, moisture, and density of the atmosphere cannot properly be commanded in any locality at will; but we can regulate our food, clothing, exercise, and ventilation as we please, wherever we are.

Now so little care has been taken in discriminating between the different stages of the disease in all the statistics and observations which we have regarding the influence of climate in tuberculosis, that they are more contradictory and confusing than useful. The conclusions to which I have come are, that in the earlier stages of the disease, especially that of predisposition to it, those conditions which favour the oxidation of carbon in the body will be most beneficial and truly curative; whereas, on the other hand, in advanced cases in which cure cannot be expected, and we can merely hope to prolong life by palliation, benefit will be derived from the moderate influence of those conditions which check the consumption of carbon. In the former case a cool bracing dry climate should be sought, and the use of large well-ventilated rooms at night, with plenty of exercise in the open air by day, only a sufficient amount of clothing to prevent chill (that next to the skin being woollen), baths gradually reduced in temperature, and a graduated scale of oleaginous food, should be assiduously yet cautiously persevered in. In most countries elevated situations, with diminished density of the atmosphere, will be preferable. In cases of hereditary transmission, perfect cure may be impossible in one generation, although great benefit will be derived from perseverance in the course advised. In cases of advanced disease we may choose a milder climate, warmer clothing, with perhaps a more humid atmosphere (?), and the pancreatic emulsion will pass more readily into the system than other forms of oil. Such palliative measures will also be advantageous in acute attacks at the outset of the disease for the purpose of lessening functional activity until inflammatory action has ceased, when we may cautiously commence the more bracing and truly curative treatment.

6. *And now, in conclusion, summer is more to be dreaded than winter in the tubercular diathesis, and safety to be sought rather in choosing a cool bracing climate in the former season than in the opposite and usual course.*—It may be urged against this proposition that most attacks of phthisis are found to take place in winter. I grant this; but I believe that the predisposition to these attacks is chiefly established during summer. The taste for fats which each winter more or less developes, continuing on into summer, is the real predisposing cause of those bilious

attacks which are so common in the latter season, the unnecessary accumulation of rich materials in the blood being their cause. In like manner the deficient digestion of, and dislike to, fats, which are the result of summer heat, continuing on into winter, are the cause of those acute attacks of phthisis which are so common then, the greater consumption with diminished supply of fat causing a disturbance in the relative proportion of the oil to the albumen in the nutritive fluid. In many cases, as we have already hinted, the salutary and counterbalancing influence of winter has for years been annulled by confinement to close apartments, too warm clothing, and insufficient exercise during the cold weather, and thus the morbid habit has become developed. For such reasons, seeing that the evil effects of too long-continued imitation of a summer temperature, with many other aggravations, have much to do with the origin of the malady we are dealing with, I think it highly advisable that this mischief should be checked by avoiding any exposure to those conditions which have given rise to it, and that we should endeavour by a continued exposure to a bracing degree of cold, with the other means already mentioned, perseveringly to conquer inch by inch the ground that has been lost until the habit of fat-digestion has been perfectly established and health restored.—*Med. Times and Gazette, June* 13 *and* 20, 1868, *pp.* 633, 658.

31.—SOME POINTS IN THE PATHOLOGY AND TREATMENT OF ACUTE CAPILLARY BRONCHITIS.

By Dr. J. K. SPENDER, Bath.

Acute capillary bronchitis has had several synonymes. It is the *peripneumonia notha* of the older authors; the *acute suffocative catarrh* of Laennec; the *asthenic bronchitis* of Dr. Copland. The nomenclature which I use now is that adopted by the most recent writers; it seems to convey accurately what is meant, to wit, an inflammation of the terminal bronchial tubes—tubes nearest to the air-cells in size and function—followed by an exudation which more or less obstructs them.

I have been surprised by the comparatively little prominence given to this appalling disorder in the best professional textbooks. Either it is scarcely noticed at all, or it is discussed as a variety of common acute bronchitis. The disease is certainly not very common, but it is by no means rare; and I now venture to plead the substantive entity of acute capillary bronchitis, and its claims to a distinct nosological position. Dr. Addison employed the term "capillary bronchitis" to signify the irritative action set up in the lung by tubercle; but it is obviously unwise to apply the same term to two diseases so etiologically different.

An adult person suffering from general capillary bronchitis of the acutest kind presents very well-marked symptoms; and, as might be expected, those that are most urgent belong to the respiratory system. (*a*) He breathes with extreme quickness; the pulse and breath ratio deviates from the norm sometimes so much as to be 2 to 1; ratios of 2½ to 1, and 3 to 1, belong to the ordinary characteristics of the disease. (*b*) He coughs very often, and expectorates a light foamy sputum. (*c*) His skin has a dusky-purple tint, the intensity of which is commensurate with the blood-stasis in the lungs.

(*a*) Concerning the first of these symptoms;—the *rapidity of the respiratory act* is governed by the law so clearly laid down by Dr. Hyde Salter, that the urgency of dyspnœa is in direct proportion to the soundness of the lung-substance, free access of air being cut off to the functioning portion of the lung by obstruction of the air passages. And this formula applies with precision to the case of acute capillary bronchitis; for, according to the conditions of the problem, the physiological area of the lung is everywhere free and capable of fulfilling its duty. The dyspnœa is severe enough even in partial capillary bronchitis; but when the disease is more or less universal, we have every condition present for producing a difficulty of the most extreme degree.

(*b*) Concerning the second point specified—the *frothy sputa* with which the finer air-tubes are choked; I remark, firstly, that this exudation does not afford so complete an obstacle to the inspiratory and expiratory currents of air as spasm of the air-tubes. Narrowing of these tubes by spasm makes the breath-currents narrow, and therefore slow. The muscular element is prolonged to the terminal bronchia; but notwithstanding this, the respiratory movements go on at a tremendous pace, and produce the well known auscultatory phenomenon of coarse bubbling crepitation—like "squeezing a sponge half saturated with water." Next, I have to indicate the probable double origin of the sputum. It is, of course, partly a true exudation from an inflamed surface, and in the ultimate stage it contains pus-cells. But there is a transudation of serum into the bronchial tubes, arising, as Dr. G. Johnson has sagaciously pointed out, from engorgement of the bronchial veins; this engorgement being a sign and a consequence of a blockade in the pulmonary circulation. And there must be a very great disturbance of the pulmonary circulation when there is such terrible apnœa. If the pulmonary œdema, which so often occurs in the course of uræmia, is a true dropsy of the connective tissue of the lung—of the *inter*-tubular structure, in fact—then the transudation of serum from congestion of the bronchial veins is an *intra*-tubular dropsy, a dropsy of the true "parenchymatous" sort; and often not less fatal.

(*c*) *The dusky hue of the skin* is sometimes loosely called cyanotic. I submit, however, that the term "cyanosis" ought to be restricted to regurgitation of imperfectly aerated blood from heart-distress, and not to mere stasis caused by difficulty in the lung. Not quite two years ago, I had under my care a case of typical cyanosis in the person of an otherwise healthy young woman, the daughter of a farmer near Bristol. The whole stress of the matter seemed to arise from a slight narrowing of the pulmonary artery (without lesion of its valves), which a dilated and weakened right heart had not power to overcome. The entire face looked as if smeared with black currant juice of the deepest dye, the lips being fearfully crimson. The dyspnœa was most intense. Now this was a true cyanosis; and the absence of any irretrievable cardiac malformation was proved by the perfect success of a ferruginous treatment, which imparted tone to the right heart, and restored the natural tint to the complexion in a few months. Compare this with the mere dull purple colour developed by capillary bronchitis and other analogous affections of the lungs, and the difference is sufficiently conspicuous to be diagnostic.

The compound condition known as "collapse" is very marked in acute capillary bronchitis. The skin is cold and sweating; the bowels are confined; the urine is turbid and very scanty. The likeness of this condition to what happens in cholera, and during a paroxysm of asthma, is evident enough.

A few words on *diagnosis*. It might be summarily asked—Is there any disease which can be possibly confounded with acute capillary bronchitis? Listen to this short story. One day last winter, there was brought to me at the Eastern Dispensary, Bath, a young girl who was wheezing, panting, and purple. Before asking the mother (who accompanied her) a single question, I said to myself—Is this child suffering from capillary bronchitis, acute tubercle, or mitral regurgitation of heart with secondary lung-disease? I ordered her home, and examined her in bed the same evening. A glance at the thermometer decided the matter; the temperature was above 103 deg., and the child was dead within three days. But I was almost amazed at the similitude of many of her objective signs to those of capillary bronchitis; the main point of unlikeness being the very scanty sputa (mixed with a little blood), and the decided heat of skin. And the history of the case was very distinct in its indications of tuberculosis.

A person who has suffered severely from capillary bronchitis is often long in recovering the usual bright florid hue of skin.

You may see him all the next summer carrying about a sure legend of the peril he has undergone; he looks metallic and dull, and is chary of any swift exertion. He has been smartly hit in a vital point, and he dreads what the next winter may bring forth. Influenza is perhaps one of the most serious epidemic maladies which he has to fear. There is usually some emaciation. Capillary bronchitis in children is always a most dangerous disease.

Treatment. — We start from the postulate, that capillary bronchitis is often amenable to skilful and decisive treatment, if it be begun early enough. The pathological picture which has been drawn is rather dark, but by no means discouraging. Certain land marks stand boldly out, which we may follow without hesitation.

On Sunday morning, April 14, 1867, I was asked to see a labouring man, a patient of the Eastern Dispensary, Bath, who was in the collapsed stage of this disease. Every feature was well marked, and he seemed in great danger. My internal remedies were—a table-spoonful of brandy every two hours; five grains of sesquicarbonate of ammonia every two hours, alternately with the brandy; and a small quantity of fresh cold milk whenever it could be taken. My external remedies were —a warm atmosphere rendered moist by steam; and a hot linseed meal poultice over the whole of the back of the chest. In the evening he was better; the skin was warm, the dyspnœa less urgent, and the urine was less scanty. The same means were continued with the same success. He improved day by day; he gradually took strong broths and less and less alcohol, and within a week was rapidly convalescent.

In some excellent clinical remarks on capillary bronchitis written some years ago by my friend Dr. Hyde Salter, he objected to using alcohol in this disease, on the ground of its giving the lung more eliminatory work to do during an emergency when physiologically it ought to be kept quiet. My apology on the other side must rest on the facts so clearly substantiated by Drs. Anstie and Inman, that (*a*) alcohol affords a positive dynamic support to the nervous system; and (*b*) it is a temporary food which sustains vital function until more complete compounds can be appropriated. And all *à priori* objections vanish before the favourable test furnished by actual experience.

Concerning sesquicarbonate of ammonia, I am amused by the divergent opinions which prevail among my medical friends about this drug. I know two physicians, one of whom literally prescribes it for almost everything; and the other as unqualifiedly declares that he has no faith in it for any curative purpose whatever. Adopting a kind of middle view, I incline to the doctrine that this salt is a valuable therapeutic auxiliary to other measures when we have to contend with certain forms of bronchial distress. I am sure of its capability to do good service in the proper asthenic bronchitis of old people. I claim for it no higher virtue, because I know our proneness to call any drug a *specific* which we know particularly well how to work with.

I would beg special attention to the absolute mortality of the smallest quantity of opium, and to the still more destructive effects of morphia.

If a patient be teased by residual catarrhal sputa, a short mercurial course will clear it away; and after that (or even at the same time) an iron tonic will help to restore the general health.

Great care must be taken at all seasons of the year that the skin is properly protected.

To recapitulate: I would specify the following points as deserving notice in the clinical history and management of acute capillary bronchitis:—

1. The extraordinary pulse and breath-ratio, and the intense dyspnœa.
2. The pathological origin and character of the sputum.
3. The quasi-cyanosis of the skin, together with the so-called "collapse."
4. The occasional indistinctness of the diagnosis from acute tubercle.
5. The necessity of a supporting and alcoholic treatment.—*Brit. Medical Journal, Sept.* 19, 1868, *p.* 304.

32.—CASE OF PLASTIC BRONCHITIS, WITH "QUASI" DIPHTHERITIC EXUDATION.

By Dr. Douglas, one of the Vice-Presidents of the Edinburgh Medico-Chirurgical Society.

[The patient, whose case forms the subject of the following article, was a letter-carrier, aged 31, a spare delicate-looking man. He complained of acute pain in the left mammary region, catching his breath, and aggravated by the least motion. Yet, with all this, the most careful examination failed to detect any physical sign of pulmonary disease.]

On the following day, his distress was in no degree abated. Pain was intense; he was flushed, with suffused eyes. Pulse 104. Tongue coated; bowels torpid; breathing little distressed. He had slept none, and had perspired profusely. On examination of the chest, the left dorsum was found dull on percussion, with tubular breathing and other signs of consolidated lung; but neither crepitation nor pulmonary rattle existed.

[The administration of half-grain doses of tartar emetic was not productive of relief. On the fifth day, dull percussion, with tubular breathing existed, and there was a gray pellicle in the throat and mouth.]

The antimony was replaced by solution of nitre, and he had a drachm of chlorine-water every three hours. Speedy abatement of his distress followed, though the pulse increased in frequency to 120. Pain with breathing ceased, the gray pellicle commenced to separate from the throat and mouth, and was not reproduced; at the same time, a rare subcrepitating rattle was developed in the contiguous confines of the left subclavian, mammary, and axillary regions.

On the eighth day of his attack, he presented a marked improvement in appearance; the respirations had fallen to 27; pulse to 112. Perspiration, which had been considerable, nearly ceased. Progressive separation of the pellicular exudation was going on; and, for the first time, he expectorated, with no great difficulty, dense globular masses of a pearly-like mucus which sank in water. These dense masses attracted my attention by their curious lobulated configuration, and the lobules or nodules on the surface unfolded themselves when the mass was shaken in water, and appeared to consist of rolled-up casts of the bronchial tubes. Examined with the microscope, the casts presented the cells and fibrous structure of epithelial *mucus* and plastic *lymph*. The subcrepitating mucous sounds already mentioned could now be traced extensively in the left dorsum.

From this date improvement was but little interrupted, though it was slow. On the eleventh day the pulse was 72; and the pellicular exudation had disappeared from the throat, leaving the subjacent mucous membrane of an intense red colour. Dull percussion persisted in both dorsal regions, with the sounds of respiration masked; and in the right there existed the sound of friction.

He was unable to be out of bed till the 12th of October (the thirtieth day of his illness), and as late as the 21st of October he was liable to acute pleuritic attacks, with catching pain and febrile heat of the skin. To the end of October augmented thrill of the voice and soft submucous rattle existed over the upper parts of both lungs, while in both lower dorsal regions there was dulness of percussion, faintness of the respiratory murmur, and diminished thrill of voice.

He resumed his official duty on the 13th of December, and he has not had occasion for medical aid since that date. I examined his chest a few days ago, and found the sounds of percussion and respiration in the normal condition. His general health is good, and he is an active and efficient officer. He complained, however, that the state of his throat interfered with his comfort in speaking and singing ; but this has ceased since the removal of the uvula, which was excessively relaxed and tumid.

Plastic or pseudo-membranous bronchitis occurs as an acute and idiopathic disease in only a small proportion of cases. I have not met with it except in the case I have described. It is more usually observed as a chronic and remitting or recurrent malady, and often complicating other and organic lesions.

The complete recovery made by this patient entitles the case to our attention ; but additional and great practical interest attaches to the case, considering the pneumonic character of its early stage, and the "quasi" diphtheritic state of the throat which it subsequently presented.

In the remarks I offer I shall not attempt anything like a full analysis of the case ; it will be better to note shortly some of the particulars which gave it peculiarity. In commenting upon a solitary case, there is no call to discuss the history or pathology of muco-plastic exudations ; and, indeed, in following the history of a case to a termination so favourable, the diagnosis and therapeutics of the disease more naturally present themselves for our consideration.

It is to be noted, that I visited the patient on the first day he was confined to the house, and, though he had shivered on the second day previously, he had performed his duty as a letter-carrier on the preceding day. It will be observed, that on my first visit my attention was fixed upon his intense suffering in the left breast (impeding movement) and upon the general fever. It seemed more than probable that this was not the suffering of a mere pleurodynia, and I was the more readily led to infer that acute pneumonia was being developed, having repeatedly met with cases of pneumonia especially involving the upper lobes of the lungs, in which distressing pleurodynia existed. I hesitated, however, in this opinion, considering not only the absence of physical signs—no exaggerated respiration, crepitation, nor any pulmonary rattle—but also considering the general state of the patient, with a look of depression so marked, and the severity of his local pain. The treatment was accordingly in some measure expectant and soothing. But on the following day the signs of consolidation in the lung of the suffering side confirmed me in the opinion and led to a more active contra-stimulant treatment.

It must be noted, however, that the consolidation arose not in the situation I anticipated, but low down in the part usually so affected in cases of pneumonia, and that it was followe almost immediately by a similar consolidation of the opposit lung. Viewing the facts of the case retrospectively, I believ that the seat and occurrence of these consolidations were determined by a broncho-pneumonia originating in communicating ramifications of the tubes, as well as independently in the cells or parenchyma of disconnected lobes of the lungs. From the hurry of repiration (42) which now occurred, it is reasonable to suppose that both lungs were involved to an extent greater than was indicated by the external physical signs. I was now shaken in the opinion that the case was one of pneumonia; and as he had taken large and repeated doses of tartar emetic with absolute tolerance, I examined his throat lest there might be any sign of local irritation from the antimony, and, to my great surprise, I found it in the state described in the narrative I have read.

In these circumstances, it was a sufficiently natural inference that the case had acquired, if it had not possessed from the outset, a diphtheritic constitution, and that the pulmonary lesion participated in this. This view, however, could not be maintained on satisfactory grounds, though the patient's general condition in a measure suggested it, and the further changes in the pulmonic symptoms appear to justify the view that the case was one of bronchitis with muco-plastic membranous exudation, the parenchyma of the lungs and the pleura being involved in the inflammatory state.

It was not until the eighth day of his illness that the peculiar expectoration set in, and on the preceding day we observe that the pellicular exudation began to separate from the throat, concurrently with submucous sounds in the chest indicative of a change in the character of the exudation there. The concurrence of these changes and the abatement of the general symptoms is evidence of the close relation of the affection of the lungs and that of the throat; but to prove or explain their mutual relations it is not needful to suppose the existence of a diphtheritic constitution. On any theory of the case, it is remarkable that the larynx and trachea should have escaped the local disease; but I shall not detain you by speculative explanations of these points.

I have not met with any other case in which the expectoration presented the peculiar dense masses which, by shaking in water, were shown to contain so fragile muco-plastic casts of bronchial tubes, larger than the smallest subdivisions. The only description of a similar expectoration I have seen is by Dr. Hyde Salter, in a case communicated by him to the Pathological Society of London, in May, 1860. Dr. Salter's case was chronic, and the bronchitis appeared to be limited in extent. I incline to think, however, that such a state of expectoration is the result of recent and more or less acute action.

In many of the cases described by authors, blood was observed mingled with the expectoration. The absence of all appearance of blood in the case of my patient is not by any means singular, though tinting of the expectoration might as a rule be anticipated, especially in cases so acute. In the present case, the distinctive peculiarities of the expectoration were the delay in its appearance, and its *general* as well as its *minute* physical characters.

I have previously said that the condition of the patient suggested that his illness was diphtheritic, though I could not maintain that opinion on grounds satisfactory to my own mind, and I am now less than ever inclined to take that view of the case.

I shall not detain you by discussing the question, which would open up considerations beyond the limits of a commentary on a solitary case.

It might indeed be argued plausibly enough that the semi-typhoid state of the patient, with a depressed circulation and protracted sweating, the disconnected pellicular exudation on the throat and bronchial surfaces—the larynx and trachea remaining intact—the absence of cough, the retarded convalescence, the prevalence of diphtheria for some time previously, of which two of his children had died, and other conditions, indicated a constitutional disease, probably diphtheritic. But though on either supposition it might be difficult to explain some of these symptoms, none of them is inconsistent with the view that the case was one of muco-plastic bronchitis, —a condition which probably has a close affinity to acute pneumonia.

The treatment by alkaline and antiseptic remedies adopted at this stage of the attack, when the albuminous and plastic nature of the exudations became apparent, was I believe, peculiarily appropriate, and the rapid improvement in the symptoms during the succeeding days was confirmatory of the good effect of these remedies. Some of the practical conclusions suggested by the case seem to be :—

1. That there may be acute pain independent of pleuritis ; and,—
2. The concurrence of isolated and disconnected centres of pulmonary inflammation.
3. The absence of cough, except with,—
4. The characteristic muco-plastic expectoration.
5. An ataxic condition of the general symptoms.
6. Recurrent pleuritic attacks.
7. Tardy convalescence.

8. That the appropriate remedies are the alkaline salts, with antiseptics and stimulants—a mode of treatment often serviceable in cases of acute pneumonia, as well as in those of diphtheria. —*Edinburgh Medical Journal, July* 1868, *p.* 2.

33.—CANNABIS INDICUS IN CATARRHUS SENILIS.

By Dr. J. Waring-Curran, Dublin.

[In those cases of senile catarrh where the mucus accumulates in the bronchiæ, where the constant dry barking cough affords no relief to the pent-up mucus, and only harrasses and distresses the patient, there is no better remedy than cannabis indicus.]

Case 1.—R. S., aged 57 years, of delicate appearance, with narrow shoulders and contracted chest, has suffered from repeated attacks of chronic bronchitis, of which she states the present is the worst attack of all. Has been ill four days. The usual domestic nostrum, paregoric, linseed tea, and Spanish juice, *et hoc genus omne*, have lost their virtue, and failed to afford relief.

The skin over the anterior part of the chest is well blistered, owing to the repeated applications of mustard poultices. The secretions are normal, and the bowels have received attention. The patient has been unable to lie on the back since the commencement of her illness, depending on the constant and distressing nature of the dyspnœa.

On stethoscopic examination all sorts of sounds are audible, on both inspiration and expiration; sibilant rales are most distinct at the base and ronchi at the superior part of thorax. There is a constant, dry, protracted cough, which "cannot get round," to use her own words, "the obstruction."

The pulse is 120; the skin moist; the lips livid, and the face blanched and indicative of suffering.

℞. Tr. cannabis indicis ʒii.; pulv. tragacanth co. ʒi.; ether chloric ʒiss.; aquæ anisi ad ℥vj. Fiat mist., et capiat ℥i. 2ndis horis.

The following day, I learned before three doses of the mixture was taken, the cough became "loose, and the expectoration easy and most profuse." She expectorated freely for several days, and rapidly recruited on a liberal regimen, and bark and ammonia mixture.

Case 2.—A. B., aged 69, subject to frequent bronchitic attacks, has been ill for a week, expectorates but little, and with considerable difficulty; is very feeble, and has been taking ammonia and senega with little alleviation, ordered the tr.

cannabis in mixture, which produced the desired effect of liberating the mucus and affording relief to the cough. Speedy recovery.

Case 3.—R. P., 70 years of age, has been previously under treatment for catarrh, now presents all the unequivocal symptoms of chronic catarrh. Has recovered sooner under the effects of cannabis than from any of her previous attacks; has grown fond of her medicine, which produces free expectoration after the administration of each dose.

Case 4.—J. P., aged 60, speedily and satisfactorily recovered from a severe and protracted attack of catarrhus senilis after the exhibition of cannabis indicis.—*Medical Press and Circular, Sept.* 9, 1868, *p.* 222.

34.—HOARSENESS AND LOSS OF VOICE IN RELATION TO NERVO-MUSCULAR AFFECTIONS OF THE LARYNX.

By Dr. Morrell Mackenzie.

[Dr. Mackenzie divides paralysis of the vocal cords according to the muscles or sets of muscles implicated. Debility and hysteria are undoubtedly the most frequent causes of this disorder, which is common in the second and third stage of phthisis, without structural change. Most commonly, however, it results from catarrhal congestion. The hoarseness and cough disappear and the voice is entirely lost. Inhalations and local applications often fail in the cure, but, the author says,]

There is one remedy which is almost always successful. This is the direct application of electricity to the vocal cords. The external application seldom restores the voice when it has been lost for any length of time, but it may often be advantageously employed in keeping up the effect produced by the more direct current. In other words, when the voice has been restored by the introduction of a pole into the larynx, the effect can often be kept up by the occasional application of the external current.

In using the direct current, one pole is introduced within the glottis, and the other pole applied externally. In this way the voice is often immediately restored. Some few years ago, I invented a little instrument called my "laryngeal electrode," by means of which the electric current can be applied with great facility to the interior of the larynx. It consists of two parts; viz., the necklet, which the patient wears, and to which one chain of the battery is attached. and the laryngeal electrode itself which is also connected with a battery. This latter is so constructed that the electric current does not pass beyond a certain point, until the pole is seen, in the laryngeal mirror, to be upon the vocal cords; when the operator touches a little spring in the handle, and the current immediately passes through the laryngeal muscles. The necklet should be worn rather low, so that it covers the sides of the cricoid cartilage, and the space between it and the thyroid. In this way the lateral adductors of the cords (crico-arytænoidei laterales) can be most easily reached, and the arytænoideus proprius, or central adductor, may be electrified, by placing the pole on the posterior surface of the arytænoid cartilages.

I generally keep the pole in the larynx for three or four seconds each time it is introduced, and pass a succession of short rapid shocks through the larynx ; and at each sitting I apply the pole to the interior of the larynx three or four times. The source of the electricity is not a matter of any importance. I have found equally good effects follow, whether a battery or a magneto-electric machine is employed.

Out of more than two hundred cases that I have treated in in this way, I have only met with four cases in which this treatment was not successful. In three of these no effect was produced, and in the fourth such violent hysterical attacks came on whenever the treatment was attempted, that it was obliged to be discontinued.

So many cases of this sort, in which the direct application of electricity succeeded after the failure of every other kind of treatment, have already been published, that I do not think it necessary to give more than three or four illustrations. I shall, therefore, select four of the most recent cases, and relate them very briefly; before do so, however, I may observe that the electricity possibly, and perhaps probably, does not act *directly* on the muscles paralysed, but *indirectly*, through reflex action, by causing a kind of spasm of the glottis. When one pole is placed on the vocal cords, and the other on the neck externally, between the thyroid and cricoid cartilages, the electric current must doubtless pass through the adductors ; but it is more probable that the contraction of these muscles is of a reflex character, brought about by the electric shock to the glottis.—*Clinical Lectures and Reports of London Hospital*, 1867-8, *p.* 85.

DISEASES OF THE ORGANS OF DIGESTION.

35.—THE THREE VARIETIES OF DYSPEPSIA.

By Dr. Henry Browne, M.A., Manchester.

[The following useful extract is from a report of the practice at the Manchester Royal Infirmary. Speaking of Dr. Browne, the Editor of the Medical Times and Gazette says :]

He recognises three principal kinds of dyspepsia, which he calls respectively sulphuretted hydrogen dyspepsia, or that accompanied with "rotten egg" eructations; carbonic acid dyspepsia, or that evidenced by tasteless eructations; and butyric acid dyspepsia, in which the eructations are sour or acrid. To a patient suffering from the first-named of these he recommends abstinence from meat and eggs, and prescribes farinaceous diet along with a mixture containing strong hydrochloric acid and chlorate of potash, filled up with a vegetable bitter. In the case of patients afflicted with carbonic acid dyspepsia he orders a lean meat diet and an avoidance of bread, potatoes, and farinaceous food generally; while to the third class he proscribes the use of sugar and fat. Dr. Browne is fond of pointing out the incalculable harm done to the digestive system by an immoderate indulgence in tea, and in his, as in every Medical out-patient room, he finds abundant illustrations of his observations. These cases he styles "tea dyspepsia," and he relies for a cure of them upon a daily allowance of wine, regularity of meals, and abstinence from tea. He insists very strongly on the necessity of wearing flannel, especially in the rheumatic diathesis, enjoining upon his patients the use not only of flannel jackets or shirts, but also of flannel drawers and woollen stockings; and he invariably adds this precept—"Never wear during the night the flannel clothing you have worn during the day, but change your flannel garments night and morning, taking care to have them well aired and dried in the meantime."—*Medical Times and Gazette, July* 25, 1868, *p.* 93.

36.—ON SULPHUROUS ACID IN THE TREATMENT OF PYROSIS.

By Dr. Henry Lawson, Assistant Physician to St. Mary's Hospital.

The very remarkable cures recorded by Dr. Dewar and Mr. Pairman, as having been effected by the use of pure sulphur vapour, led me to give sulphurous acid a trial in cases of pyrosis, and certainly the result surprised me. *In every instance in which it has been employed it has, in a very short time, completely arrested the water-brash secretion.* Indeed, it has given me so much confidence in its valuable action, that I now never hesitate to assure the patient he may very soon hope for relief from at least the distressing symptom of pyrosis. Dr. Dewar and Mr. Pairman have advocated the use of sulphurous acid to a degree that I should be far from accepting, and have been, in my opinion, over-zealous in urging its claims as a panacea. But for all this, I am disposed to think its usefulness in conditions of pyrosis can hardly be over-rated. It checks the excessive secretion, stops the vomiting and lessens the epigastric dragging pain so often complained of.

What is the explanation of its action? This is a question which is especially interesting just now, but which it is impossible to answer definitively in the present state of science. Some would say its good effects are due to the production of ozone and the destruction of vegetable germs, and among these I desire provisionally to rank myself. Others would, perhaps, urge that it has some special action on the mucous membrane. It is a significant fact, first that in all the specimens of water-brash immense quantities of vegetable organisms are present; and, secondly, that sulphurous acid is fatal to these structures. I have made numerous microscopic examinations of the fluid of pyrosis, and in nearly every instance I have detected not only sarcinæ (which Kühne holds to have no fermentative power on sugar) and torulæ, but huge clusters of leptothrix and myriads of vibrions, and backteria.

Pasteur has shown the vast influence which these latter bodies have in promoting certain fermentation, and it is only natural to suppose that the sulphurous acid, by destroying them, checks these unusual processes. That the clusters of leptothrix are productive of irritation (hence possibly of undue secretion), must be evident from the manner in which they are buried and rooted in the very substance of the epithelium particles. Whatever, then, may be the relation of an unhealthy condition of the stomach to the first development of these vegetable forms in its walls, I am induced for the present to infer that their continual presence is productive of the excess and alteration of the gastric secretion, and that the reason why sulphurous acid is so beneficial, is simply that it is a parasiticide.

The doses in which I have given the acid (B. P.) vary from ♏xxx to ʒj three times a day, shortly before meals. Bitter infusions may be employed as a vehicle, but plain distilled water is best. I have seldom heard patients complain of any unpleasant effects of the medicine.—*The Practitioner*, *Sept.* 1868, *p.* 169.

37.—ON CHOLERA AND DIARRHŒA.

By Sir Thomas Watson, Bart., M.D., F.R.S.

[There are two conflicting theories as to the pathology of cholera. The whole question is fully put before the reader in the following paper.]

It is acknowledged on all hands that the primary and special danger in cholera lies in its period of collapse. Now it was a very natural and plausible theory which attributed this state of collapse to the drain of fluid matters from the blood by the profuse and repeated fluxes from the stomach and bowels; and the practice suggested, as a direct corollary to this theory, was that of endeavouring to arrest the destructive flux by astringent drugs and by opium, and to restore the spent strength and the lost animal warmth by alcoholic and other stimulants.

It is affirmed, on the other hand, that the condition called collapse is not due to the excessive discharges from the body; that those discharges are really eliminative of the poison, or of the products of the poison, which caused the disease, and are to be permitted, or even encouraged, rather than checked; and, therefore, that astringents and opiates can do no good, but are, on the contrary, positively hurtful.

Were the first mentioned theory true, there must be a discernible relation between the alleged cause and its effect. The greater the amount of the intestinal discharges, the more certain and the more decided should be the resulting collapse. But no such proportion has, in fact, been observed. Nay, the very reverse not seldom obtains. The most hopeless cases are those of collapse after very scanty discharges, or with no discharges at all.

Again, if the collapse were indeed owing to the drain upon the blood effected through the intestinal discharges, it would be prolonged, deepened, and rendered more perilous, by the continuance of those discharges; whereas it is notorious that patients emerge from the state of collapse while the evacuations go on, and that the cessation of the evacuations during collapse is a fatal sign.

Tested, then, by the evidence of acknowledged facts, this theory must be pronounced a failure, and the treatment founded upon it a mistake.

In truth, a fallacious analogy has been assumed between the collapse or exhaustion arising from a drain upon the blood and the collapse in cholera. In one single point—namely, the smallness and weakness of the arterial pulse (in other words, the defective circulation of the blood)—the two may seem to touch each other. In almost every other point, they differ widely. A person exhausted by loss of blood, or by a long continued drain upon that fluid, is in a state that is very near to syncope. When the exhaustion is extreme, if he assume the erect posture, he faints outright, and becomes unconscious. To walk, to stand, or even to sit up, is simply impossible: whereas, in the collapse of cholera, syncope is well-nigh unknown. The patient, with death stamped apparently upon his features, with no pulse to be felt at his wrist, with a blue and icy-cold skin, is not faint, but able to walk about the room, and to perform many of his usual functions. The exhausted man, if he recover, recovers slowly; the repair of his impoverished blood is necessarily a gradual process. The cholera patient rallies from his collapse at once, if at all. He may be in full collapse to-day, and convalescent the day after to-morrow, and apparently but little the worse for the terrible disorder through which he has so recently passed. "I have seen," says Mr. Grainger, "a man stand at his door on Wednesday, who on Monday was in perfect collapse." Again, the way in which remedies tell upon the two contrasted conditions is totally and instructively unlike. The coldness and faintness of exhaustion are relieved at once by a glass of wine or of brandy; the pulse instantly acknowledges the virtue of the stimulus. But alcoholic stimulants do not warm or invigorate, even for a moment, the patient in choleraic collapse: rather, they seem to make matters worse. On the other hand, blood-letting has often brought marvellous relief under collapse; while to draw blood from a person who is fainting from exhaustion would probably ensure his death, and would certainly aggravate his danger. Take the following instance, recorded by Sir Ranald Martin, of the effect of venesection. "On visiting my hospital in the morning, the European farrier-major was reported to be dying of cholera. I found that during the night he had been drained of all the fluid portion of his blood. His appearance was surprisingly altered; his respiration was oppressed the countenance sunk and livid; the circulation flagging in the extremities. I opened a vein in each arm; but it was long before I could obtain anything but trickling of dark treacly matter. At length the blood flowed, and by degrees the darkness was exchanged for more of the hue of nature. The farrier was not of robust health, but I bled him largely; when he, whom not a moment before I thought a dying man, stood up and exclaimed, 'Sir, you have made a new man of me.' He is still alive and well."

The question has naturally been put, "Is it possible to reconcile facts of this kind with the theory that the collapse of cholera results from the loss of the liquid constituents of the blood? If Sir R. Martin's hypothetical statement that his patient 'had been drained of all the fluid portion of his blood' were an accurate expression of facts, can we conceive it possible that he could 'have made a new man' of him by abstracting largely the blood which remained in the vessels?"

The main advocate in this country, and, as I think, the triumphant advocate, of what may be called the evacuant or cleansing practice in cholera, is your present able professor of physic, Dr. George Johnson. To him is justly due the great merit of having established, by his persevering efforts, in the face of much opposition and discouragement, the worth and efficacy of that practice; although he was not the first to recommend or to adopt it. It was in fact tried, with favourable results, nearly half a century ago, by English practitioners in India; its professed object being that of getting rid of offensive morbid secretions. The practice thus vouched for by Dr. Johnson is directly in accordance with, and serves to confirm that view of the pathology of cholera which, by a methodical display of numerous facts, and by a process of close and conclusive reasoning, he may fairly challenge as his own. Briefly, he holds, as many before him held, that the phenomena of cholera results from the entrance of a peculiar poison into the blood, where it probably undergoes, like that of small-pox, a rapid process of self multiplication, and spoils certain of the blood-constituents, which are then ejected through the mucous membrane of the alimentary canal; that the copious discharges are expressive of the efforts of nature to throw off a noxious material, and really form, therefore, a necessary part of the process of recovery; and that, if the pouring forth of the vascular excretion be checked (as it can, perhaps, be by opium), the risk of fatal collapse is thereby increased. He declares that the results of his own practice, founded on these views, have amply justified them; and a considerable body of other evidence has now been furnished in support of the same plan of treatment. Whatever may have been his earlier purpose, he does not now propose to *excite* discharges from the mucous surface of the digestive canal; but simply to facilitate the removal of matters lodged there. And this he would do by emetics, by draughts of tepid water or other diluents, or by castor-oil, of which the action is both speedy and gentle.

It is plain that, if "elimination" be a condition of recovery, the method of elimination is nature's method, which art may help or hinder—help by the cleansing method, hinder by the astringent.

For a full appreciation of Dr. Johnson's very novel and interesting, and to my mind satisfactory, disquisitions as to the general pathology of cholera, I must refer you to his paper in the fiftieth volume of the *Medico-Chirurgical Transactions.* What we are now concerned to ascertain is the comparative result of the two conflicting methods of treatment. Upon this point there is, in the same volume of *Transactions*, a most instructive communication from Drs. M'Cloy and Robertson. They show that of 375 cases of cholera admitted into the Liverpool Parish Infirmary in the last epidemic, 161 proved fatal—a gross mortality, under all the modes of treatment adopted, of 42.93 per cent. Of these cases, 91 were treated with astringents and stimulants, camphor and iced-water, applications of ice, and hypodermic (opiate) injections; and the mortality per cent. of these cases was 71·42. 87 cases were treated with castor-oil, and with a liberal use of food and alcohol; and the mortality was 41·37 per cent. 197 cases were treated with castor-oil only, and the mortality was 30·45 per cent. The authors of the paper declare that "recovery never occurred without the continuance of the intestinal discharges, or their restoration, if previously arrested."

When I last spoke on this subject in these lectures, I stated that the few recoveries which I had witnessed had all taken place under large and repeated doses of calomel, but that I could not venture to affirm that the calomel cured them. At present, I am much disposed to believe that, by its cleansing action, the calomel may have helped the recovery; and, after all that I have since seen, heard, read, and thought upon the matter, I must confess that, in the event of my having again to deal with the disorder, I should feel bound to adopt, in its generality, the evacuant theory and practice.

Now, if this theory and practice in respect of cholera be true and right, the practice ought to be right in respect of the associated diarrhœa also; and it is strongly affirmed by those who have largely tried it, that it is right, inasmuch as it is eminently successful. Dr. Johnson avers that he has found it so.

Hear the concurring testimony of Drs. M'Cloy and Robertson. "Our experience of diarrhœa was very extensive. Several thousand cases came under our observation in the different dispensaries connected with the West Derby Union and in the Liverpool Parish Infirmary. Among these were doubtless many which would have recovered under any mode of treatment, or by the *vis medicatrix naturæ* alone. But there were many, too, of a most severe choleraic type. The treatment adopted was generally evacuant in its nature; and consisted in the administration of castor-oil, calomel, rhubarb, or magnesia. In every case relief was afforded 'pleasantly, quickly, and safely.' It was but seldom that more than two or three doses of oil were required." The medical officers of the Bootle Dispensary depose to the same effect: "We certainly had less trouble with the evacuant mode of treatment. Our patients seldom gave us a third visit; two doses of castor-oil or rhubarb mixture being generally sufficient to cure the disease. We never saw a diarrhœa patient, treated with evacuants from the commencement of his attack, require subsequent removal to hospital. In a large proportion of our cases there was 'premonitory diarrhœa' which had been treated, often for four or five days, with astringents. Diarrhœa patients undoubtedly recover when treated with astringents; but the recovery is not consequent upon the arrest of the discharges, as these are invariably restored before the patient feels well."

In the face of this and much similar evidence, I feel bound to say that the rules laid down by Dr. Johnson for the treatment and prevention of diarrhœa and cholera, seem now to me safer and better than the less discriminating advice which heretofore I gave you; "whenever a suspicion arose that cholera was present in the community, not to try, in cases of diarrhœa, to carry off the presumed offending matter, but to quiet the irritation and to stop the flux as soon as possible, by astringents, aromatics, and opiates."

No doubt, the true indication and treatment is, "to stop the flux as soon as possible;" but this may sometimes be best effected (as also in crapulous diarrhœa, and in the summer cholera of Sydenham), "*by* carrying off the offending matter."

In language chiefly his own, but partly also mine, Dr. Johnson writes as follows.

"*Diarrhœa ought not to be neglected, even for an hour.*"

"One important and guiding rule of treatment is, *not to attempt by opiates, or by other directly repressive means, to arrest a diarrhœa, while there is reason to believe that the bowel contains a reasonable amount of morbid and offensive materials.*"

"The purging is the natural way of getting rid of the irritant cause. We may *favour* the recovery by directing the patient to drink copiously any simple diluent liquid—water (cold or tepid), toast-water, barley-water, or weak tea; and we may often accelerate the recovery by sweeping out the alimentary canal by some safe purgative, and then, if necessary, soothing it by an opiate. Castor-oil, notwithstanding its unpleasant taste, is, on the whole, the safest and best purgative for this purpose. It has the advantage of being very mild and unirritating, yet withal very quick in its action. A tablespoonful of the oil may be taken, floating on cold water, or any other simple liquid which may be preferred by the patient. A mixture of orange-juice or of lemon-juice with water forms an agreeable vehicle for the oil. If the dose be vomited, it should be repeated immediately; and the patient should lie still, and take no more liquid for half an hour, by which time the oil will have passed from the stomach into the bowels. Within an hour or two, the oil will usually have acted freely. Then a tablespoonful of brandy may be taken in some thin arrowroot or gruel; and, if there be much feeling of irritation, with a sense of sinking, from five to ten drops of laudanum may be given in cold water. These means will suffice for the speedy arrest of most cases of choleraic diarrhœa. If the patient have an insuperable objection to castor-oil, or if the oil cannot be retained on the stomach, ten or fifteen grains of powdered rhubarb, or a tablespoonful of the tincture of rhubarb, or a teaspoonful of Gregory's powder, may be substitued for the oil."

"If the diarrhœa have continued for some hours, the stools having been copious and liquid; if there be no griping pain in the bowels, no feeling or appearance of distension of the intestines; the abdomen being flaccid and empty, and the tongue clean—we may conclude that the morbid agent has already purged itself away. There will, therefore, be no need for the castor-oil or other laxative; and we may immediately give the brandy in arrowroot, and the laudanum, as before directed. The rule in all cases is, *not to give the opiate until the morbid poison and its products have for the most part escaped*; *not to close the door until the 'enemy' has been expelled.* While there are some cases in which the evacuant dose is not required even at the commencement of the attack, there are many more in which the opiate is unnecessary in the later stage. In some cases of severe and prolonged diarrhœa, it may be necessary to repeat the oil and the laudanum alternately more than once at intervals of three or four hours. Practical skill and tact are required to discriminate these cases It must be borne in mind that, when the choleraic secretions are being actively poured out from the blood-vessels, the bowel, though it may have been completely emptied by a dose of oil, may quickly again become filled with morbid secretions, and hence the need for an occasional repetition of the evacuant dose."

"If the diarrhœa be associated with vomiting, this should be encouraged and assisted by copious draughts of tepid water. The vomiting affords relief, partly by the stimulus which it gives to the circulation, but mainly by the speedy ejection of morbid secretions."

"If there be nausea without vomiting, and more especially if the stomach be supposed to contain undigested or unwholesome food or morbid secretions, an emetic may be given—either a teaspoonful of powdered mustard, or a tablespoonful of common salt, or twenty grains of ipecacuanha powder, in warm water."

"In all cases of severe diarrhœa, the patient should remain in bed."—*British Medical Journal, July* 18, 1868, *p.* 49.

DISEASES OF THE URINARY ORGANS.

38.—UREA AND URIC ACID: THEIR RELATION TO HEALTH AND DISEASE.

By Dr. B. Kelly.

When we take into consideration the great importance of the urine as an excrementitious liquid, and the part it has played from time immemorial in the pathology of numerous diseases, we may be somewhat surprised why its chemical composition and morbid qualities should have so little occupied, until a comparatively recent period, the attention of medical men. But if these portions of its study have been ignored and neglected, its reputed value as a *polychrest*, or useful remedy in sickness, has been recognized from a very remote antiquity.

Aristotle observed that when urine was retained unduly long in the bladder it emitted a stronger and more offensive odour after expulsion than when voided after the usual interval—a change which he justly attributed to the gross and viscid properties it thus acquired.

That the practice of *autouroposis* must have originated at an early period of the world either through the injunctions of physicians, or (which is not improbable) through the impulse and dictates of morbid imaginations, there cannot be a serious doubt; and yet disgusting and unnatural as the habit may have been, it was far exceeded in this respect by the internal use of *album græcum*, *meconium*, and the *sulphur occidentale* of Paracelsus. Celsus records the death of a favourite of King Antigonus, who died from the effects of drinking his own urine. This personage, according to the assertion of the great Roman physician, was notoriously intemperate. Pliny states that the suppressed menses are restored by the patients inhaling the warm fumes of fresh urine excreted by males under the age of puberty. The same author also believed, that as fullers were never troubled with the gout, and as stale urine was the liquid used by them in his time for scouring woollen fabrics and other articles of clothing, it must, therefore, be an appropriate, if not an effectual, remedy for the disease in question. But indeed there was scarcely a malady in the entire nosological catalogue against which the internal and external use of urine, fresh or stale, had not been deemed a sovereign specific from the days of Celsus and Pliny down to a century or two ago. The *autouroposis* of the ancients bids fair to be revived under a modified and less disgusting form by the modern application of certain saline constituents of the urine to the treatment of disease. Even in our own day, the besotted inhabitants of Kampschatka, who eat the Amanita Muscaria for the sake of its exhilarating influence upon the animal spirits, are wont, when the supply of the fungus is exhausted, to prolong its intoxicating effects by drinking freely of the urine they excrete after its use.

The first physician I find, in looking back through the long vista of time, who seemed to have had any definite knowledge of the chemical composition of the urine, is the renowned Dr. Willis. In his treatise on the several kinds of urine, he gives a rough, but rather comprehensive, analysis of this liquid.

According to him, it consists of a large quantity of serum, a less amount of salt, sulphur and earthy matter, and a small proportion of spirit. Van Helmont, the Flemish physician and chemist, who was a contemporary of Willis', bestowed considerable attention on the physical characters of the urine. That, passed on rising in the morning, he called *urina sanguinis*, in contradistinction to the *urina potûs*, or that resulting from beverages.

It is quite unnecessary to allude here to the long and illustrious list of physicians of our own times who have rendered themselves immortal by their researches in the domain of urinary pathology, as their works and achievements are fortunately well-known to the profession. But, as the subject is far from being exhausted, I have deemed it not unworthy or profitless to devote a few pages to the consideration of urea and uric acid, as two of the most important proximate principles of the urine, whether in a physiological or morbid point of view, and the relation they bear to the system in health and disease.

Urea.—This substance, which results from an oxidation, or species of slow combustion of the constituent elements in the tissues, is constantly found in the blood, urine, and other organic liquids of the economy, but more especially in the lymph and vitreous humour. It is excreted from the system exclusively by the kidneys and skin in a state of health; but in Bright's disease and other organic affections of the kidneys, the gastro-intestinal mucous membrane vicariously discharges the function of the disordered glands, and effects the removal of a large share of the noxious principle from the blood. Hence the vomiting and diarrhœa which not unfrequently accompany the more advanced and serious cases of albuminuria. These accidents, being in a measure critical of the disease, and curative in their tendency, ought never to be incautiously interfered with or suddenly checked.

Whether urea be obtained as a constant and natural product of the living body, or as fabricated in the laboratory of the chemist, its physical characters and elementary constitution are always the same. Dry urea contains no water of crystallization, and, being a quartornary compound, possesses all the well-known chemical instability of such substances. Whether hydrated or anhydrous, it is readily converted by stale or putrid mucus, or by any agents capable of acting as ferments, into carbonate of ammonia. It is dimorphous, that is to say, capable of assuming two distinct crystalline forms according as it is slowly or rapidly evaporated.

Urea is in its origin and essence purely excrementitious; and where, from any cause, it is suffered to accumulate in the blood, it invariably gives rise to alarming nervous accidents, as amaurosis, convulsions, paralysis, &c., which, if neglected, usually terminates speedily in death. It also occasionally enters as an active element into the pathogeny of serous inflammations.

The first liquid of the body which contains urea in largest proportion is the lymph. The lymphatic vessels, indeed, may be said to be purposely set apart for the special absorption and accommodation of this substance, in the same manner as the lacteals are for the imbibition and reception of the chyle. The more abundant the lymph, the more abundant, all other things being equal, will be the quantity of urea contained in it; and as the quantity of lymph increases up to a certain point in a state of abstinence, and as the individual, in such circumstances, feeds, so to speak, and subsists upon his own tissues, the proportion of urea necessarily increases, thus demonstrating the large amount of animal matter that was necessary to be consumed to supply the want of the customary food, and to keep the living machine in active motion. When abstinence, however, is prolonged to an extreme degree, so as to approach starvation, not only the serum of the lymph greatly diminishes, but its solid constituents, and notably the urea, decrease, yet not to the same extent as the watery portion of the humor.

The venous blood always contains a greater or less quantity of this substance in solution, which not only varies from one vein to another, but according as the subject of the experiment is in a state of repletion or one of abstinence. The amount of urea contained in the venous blood in the former case is relatively small, for the reason that the vessels are filled to turgidity and have barely power to support the column of blood circulating in them; while in the latter, the veins are comparatively empty and flaccid, and endosmosis of liquids with their soluble contents readily takes place through their walls. The left vena innominata contains a greater proportion of urea than all the veins of the body, from the fact that the greater thoracic duct empties its contents into the left subclavian previous to its junction with the internal jugular of the same side; next to this vessel, the brachiocephalic of the right side contains the greatest amount of urea, more especially when the lesser thoracic duct enters it. The renal veins, for obvious reasons, contain the smallest share, and yet they are never entirely free from it either in a diseased or healthy state of the kidneys.

As a greater or less quantity of urea is always found in the blood of the renal veins, it becomes a question to decide from what source it may be derived. There are only two points to which we can legitimately trace its origin; either it must have escaped the filtering process in the kidneys, and thus directly entered the capillaries of the renal veins; or it may have penetrated the coats of the latter from the substance of the glands in which it had been formed as an effete product of nutrition. The former view in all probability is the more correct, especially in presence of the anatomical fact that the organs in question are duly supplied with lymphatics, not very abundantly, it is true, but yet sufficiently so to effect the removal of the urea as rapidly as generated. In Bright's disease, however, and in acute nephritis, the quantity of urea carried off by the renal veins is almost as great as that contained in the renal arteries.

The arterial system always contains a larger share of urea both in health and disease than the venous. When we take into consideration that, with the exception of the small quantity removed from the renal arteries, the entire mass of the urea centres here, we may well be surprised why an element so excrementitious in its nature, and so deleterious to the healthy functions of the economy when, from any cause, it has accumulated to excess in the blood, should circulate so freely in the arteries without producing any serious disturbance or perceptible change in the process of nutrition.

The existence of urea in large quantity in the vitreous humor was first verified by Millon, and has ever since puzzled scientific men to account for its presence in a secretion which is so very dissimilar to the urine both in physical and chemical characters. I have ventured to approach the vexed question, and to offer an explanation thereon, leaving it to others to judge of its correctness. We know that the vitreous humor being a permanent, recrementitial product of secretion is never absorbed, at least in no appreciable quantity in the healthy state, but remains hermetically enclosed in the cavity of the eyeball. Possessing great viscidity and consistence, its endosmotic property is also very considerable. But as urea is formed in the tissues of the body wherever blood-vessels and lymphatics are found; and as it is dissolved by the fluids which bathe and permeate these tissues, it must necessarily enter the vitreous humor; and as it cannot possibly escape unless the humor has undergone liquefaction, it must increase by gradual and constant accessions. How far its accumulation may be instrumental in producing or aggravating certain forms of blindness and impaired vision may become a fruitful subject of inquiry in future experimental research.

Uric Acid.—This substance resembles urea in being an organic product of nutrition, and in elementary constitution, but is entirely unlike it in its chemical affinities and reactions, as well as in physical characters. It is also unlike it in not being ever formed outside of the living system by artificial means. Besides forming stable compounds with soda, lime, potash, magnesia, and ammonia by converting them, as the case may be, into alkaline, neutral, or acid urates, it is changed into alloxan and allantoin—the highest degrees, possibly, of oxydation, if we except alloxantine and parabanic acid, to which this principle is capable of being raised—the former by nitric acid, the latter by the peroxide of lead.

Uric acid, which in the human subject is always a morbid product when it exists in excess in the blood and urine, is a normal. excrementitious principle of tissue-metamorphosis in insects, birds, and reptiles. As the nitrogenous elements abound in the systems of these animals, and very little of the fatty or carbonaceous, we can reasonably account for the enormous quantity of uric acid and urates, and the extremely small proportion of water and carbonates excreted by them. In herbivorous mammalia, on the contrary, uric acid and the urates are never found as constituent elements of their urine in its normal condition; whereas urea, the alkaline carbonates and phosphates, are abundantly formed as natural products in their systems, and are copiously discharged in their urine. When, however, such animals are kept in a state of abstinence for a time varying from twenty-four to forty-eight hours, the alkalinity of their urine disappears, and, with it its usual turbidity ; the excreted liquid becomes limpid, and exhibits a decided acid reaction, owing to the presence of uric acid, and acid urates and phosphates contained in it. Claude Bernard accounts for this remarkable change in the physical characters and chemical constitution of the urine of herbivora during abstinence, by referring to a counterchange which ensues in the nature of their aliments—the animals, in such circumstances, living upon their proper tissues, thus becoming, for the time being, to all intents and purposes, carnivorous.

It is known that cold-blooded animals, as reptiles, whose respiration is very slow, abundantly excrete uric acid, either free, or in combination with alkaline bases, especially ammonia. From this it has been inferred that the formation of uric acid, whenever it occurs in the human subject, results from a deficient oxydation of the nitrogenous elements of the food and tissues. Cl. Bernard, however, warns us earnestly against accepting thfs theory, and cites, as an illustration, the example of birds, in whose systems uric acid is freely generated, notwithstanding that their respiration is extremely rapid. Here, truly, is a dilemma—how to reconcile a uniform and constant effect with conditions and causes so diametrically opposed. For my own part. I think that the conditions in question are not so conflicting as they seem. The respiration of reptiles, it is true, is very slow ; but their circulation, also, is equally torpid ; there is consequently an equilibrium established between both functions. In birds the contrary of this obtains ; their respiration is very active, as is, also, their circulation ; their blood, too, is extremely plastic from its great richness in coagulable principles, especially fibrine. The generation of uric acid takes place, as we know, with equal uniformity in both cases under apparently different circumstances. We cannot attribute its formation exclusively to an active respiration, nor yet to a slow, we must, therefore, look to other conditions and causes than those mentioned in order to solve, with any degree of satisfaction, so perplexing a problem.

I have already stated that the nitrogenous elements abound in the systems of insects, birds, and reptiles, and that the carbonaceous or fatty matters are greatly deficient, or only exist as secondary, or accessory constituents. Hence the great quantity of uric acid and urates (all azotized products) normally formed and eliminated by them ; whereas water and the carbonates are so extremely scant as only to amount to mere traces in their excrements. Let us look again to the sheep and ox, for instance, in whose bodies are usually hoarded up such great masses of fat, and what do we find ? Neither uric acid nor urates are ever discharged by them as normal excrementitious products while the alkaline carbonates and earthy phosphates are so abundantly excreted by their kidneys, that their urine may be well considered a saturated solution of these substances.

Like all other herbivorous mammalia, these animals are heated more by the combustion of their fat than by the oxydation of the nitrogenous principles of their compact tissues. The reverse of this obtains in birds and reptiles ; not being furnished with the so-called calorifacient substances. or only so to a very limited degree, combustion of their solid structures, and as a consequence, oxydation of their constituent elements, take place ; and hence the marked disparity in the nature of their excrementitious products as compared with those of the above-named animals.

Uric acid being very sparingly soluble, requiring as it does, 10,000 parts of water at 60° for its solution, it becomes an important question to decide why it should remain soluble in the blood and urine, not being spontaneously precipitated from the latter for many hours after emission, even when it exists in abnormal quantity, as in cases of gout and rheumatism. Heat, we know, is favourable to its solubility, but when once crystallized, elevation of temperature may be carried almost to the point of decomposing it without effecting anything more than its partial solution, unless the quantity of liquid employed bears an exaggerated proportion to the amount of acid to be dissolved. It is quite possible, however, that as fermentation rapidly takes place after expulsion of the urine, under certain morbid conditions, the more soluble urates become decomposed through the agency of new-formed acids (the lactic and acetic), the substance in question is precipitated, the liberated bases being converted into lactates and acetates.

The chloride of sodium, which always exists in greater or less quantity in the blood and urine, assists materially in keeping the urate of ammonia soluble in these liquids; but I am not aware that it exerts a similar influence over uric acid.

The urates, also, are remarkable for their slight solubility in water and the urine, and may be distinguished by this character from other saline substances with which they are usually associated, and with which, as a consequence, they might readily be confounded. They become more soluble by heat, and by the addition of alkaline carbonates and phosphates, which, without decomposing them, convert them from acid salts into neutral or alkaline urates.

Urea is a natural and constant product of nutrition in the human subject so long as the functions of the organism are performed with regularity and health; but when from any cause these are deranged, the urea ceases to be formed in normal quantity, and its place becomes occupied by uric acid and its compounds. Hence we find these substances in great abundance in remittent, intermittent, typhoid and other fevers, in rheumatism, gout, and in all acute and many chronic inflammations. According to Cl. Bernard, the urea also diminishes in the urine towards the last stage of inanition. This may be explained by keeping in view the well-established fact that in the early stage of abstinence the lymph and urea are increased in absolute and relative quantity, the system as yet being vigorous and not suffering from the depressing effects of actual starvation, the animal meanwhile feeling upon his own tissues. All this is changed when he has fallen into that state of utter debility consequent upon long-continued fasting. The circulation becomes slow and languid, and in this manner keeps pace with the retarded respiration; the surface is dry and rigid, the tissues in general grow atrophied, all the organic liquids of the body—blood, lymph, urine, &c., with their constituent proximate principles—are reduced to the lowest possible ebb, and evince a strong tendency to putrefaction, as well *in situ* as when withdrawn from the system.

Frerichs and Wöhler have found that when urate of potash had been taken into the stomach, the normal quantity of urea contained in the urine had increased. From this observation they were led to believe that the excess of urea was due to an oxydation of uric acid, which they therefore considered to be the mere exponent of the first step in the oxydation of azotized substances. M. Gallois, who repeated the same experiment, was unable to verify the result obtained by the German physiologists. On the contrary, he found that the quantity of urea usually voided in the twenty-four hours had sensibly diminished.

If oxydation is to be measured by the degree of heat evolved in the human system as in external combustible substances, we are forced to admit that the elements entering into the constitution of uric acid undergo a higher oxydising process than those of urea in the diseases mentioned. Chemical analysis of both these products confirms, I believe, the correctness of this deduction. The atomic composition of urea is thus represented: —$C_2\ H_4\ N_2\ O_2$; and that of uric acid—$C_{10}\ H_4\ N_4\ O_6$. We here see that uric acid contains oxygen in the proportion of 6 to 18, or one-third of the other equivalents; whereas urea only contains the same gas in the ratio of 2 to 8, or one-quarter of the whole. I myself have for a long time adhered to the doctrine still accepted by continental, and by most, if not all, American physicians, which maintains that the formation of uric acid is the result of a lower degree of oxidation of the elements that compose it than that of the same elements constituting urea. I have renounced it, however, from conviction, but am prepared to acknowlege my error when proved to be wrong.—*Medical Press and Circular, July* 22, 1868, *p.* 72.

39.—ON CERTAIN DISEASES OF THE BLADDER: PARALYSIS; ATONY; JUVENILE INCONTINENCE.

By Sir Henry Thompson, Surgeon to University College Hospital.

[The patient whose case commences the following paper was nearly sixty years of age; he had passed his water much too frequently for five or six years. He also stated that]

Lately it has come away without his knowledge during sleep; that when he makes an effort at work the same thing often happens; that the stream is weak, falling almost perpendicularly; that he has "no particular pain," but is not so strong as formerly, having become much weaker of late; and that for the last few months the urine has been cloudy and has had a disagreeable smell. With all this his ordinary functions had been fairly performed, and he had followed his daily labour until three weeks ago.

The man was desired to unfasten his dress; as he did so you remarked a urinous odour, and that certain cloths which did duty for an india-rubber receptacle—a luxury beyond the means of our patient—were wet with the secretion. Two conditions only could cause this unhappy state of things: either the bladder was incapable of doing its duty as a reservoir, and permitted the urine to escape as fast as it entered from the ureters, or it was unable to expel its contents, so that it was over-distended by them, the surplus oozing out, or being forced out, in the manner described.

Now a glance of the eye might have nearly sufficed to settle this question. I pointed out a marked protuberance above the pubic symphysis; and after placing the patient on his back, the dulness by percussion corresponding with that spot, and the clear bowel-note all round, diminished the doubt as to its nature, if any yet existed. Still, this was not quite all that it was necessary to know; it was just possible that the swelling might be a solid tumour of the bladder, occupying its proper space and much more, and so destroying its function as a reservoir. To the hand, however, the protuberance was clearly made up of fluid; but even this is short of absolute demonstration, for the most practised hand has been known sometimes to "lose its cunning," or to have found a too deceptive quality in the object handled. Finally, you saw that a well-curved gum catheter glided into the bladder, and upwards of 40 oz. of somewhat stale urine flowed off. I then examined the prostate, and found no very obvious enlargement.

Now, was this a case of "paralysis of the bladder"? Certainly not. His history showed that he had had no seizure of any kind; and I beg you to understand that without some change in a nervous centre there is no paralysis of the bladder. This term is applied, or rather misapplied, every day to such cases as the one before us, and with the result not merely of masking the true pathological state, which ought always if possible to be indicated by a nosological term, but of misleading the inquirer, since it indicates a condition which by no means exists.

What, then, is the defect or disease occasioning the symptoms in this case? Probably, atony of the bladder; I will speak presently with more precision. The bladder fails to expel its contents in the two following conditions: either a growth from the prostate, by no means necessarily large, obstructs the neck, so that the natural power of a healthy bladder—which may, moreover, have been reinforced for the difficulty, by hypertrophy of its fibres rendering it stronger—cannot propel the urine by or over the obstruction into the urethra; or these muscular fibres of the bladder are so enfeebled, or even atrophied, that their propelling power is lost or greatly diminished, and the organ becomes a thin flaccid bag, and can exert no expulsive force upon its contents.

The two conditions sometimes coincide. We may have hypertrophy of the bladder following obstruction from stricture of the urethra. On the other hand, with obstruction from the prostate, the vesical coats sometimes extend and become thin. But atony may be produced without any disease of the prostate, and then mainly from the subject of it having been placed in circumstances which obliged him to retain his urine for a too considerable period, so that the bladder became over distended, and has failed subsequently to regain its tone. Unfortunately, a single error of this kind will sometimes produce an irremediable atony.

Now on further questioning our patient we did not find that he could recall any such instance, nor that he ever formed the habit of permitting such over-distension. Neither did the affection occur suddenly; on the contrary, the symptoms appeared gradually. What is still more significant is, that they occurred just at the time of life when prostatic hypertrophy commences, if it appears at all. Still, the prostate was not obviously large on examination by the bowel. We arrive, then, at the following conclusions :—That this man has some enlargement of the prostate, which, though not obvious in the rectum, consists in a small nipple-like projection of the median portion, occluding the neck of the bladder, and that, from the size of the bladder, as just now demonstrated by percussion, and by its contents, its walls are thin, and have lost their contractile power, in other words, are in a condition of atony.

I think there is no escape from these conclusions, and I beg that you will not only never permit yourselves to allude to this condition as "paralysis," but that you will protest against so loose and improper a use of the term when you hear of it thus misapplied by others. Now true paralysis of the bladder occurs from injury to the spine, and also as one of that large group of symptoms which result from disease in the cerebral or cerebro-spinal centres. You find it associated with slightly unsteady gait, with impaired articulation, or with some of the slighter signs of such central mischief, as well as with those which are most obvious; and I have even found it persisting after all other signs have nearly—I cannot say quite—disappeared.

In all cases, as in that of this patient in the ward, it is essential to empty the bladder by means of the gum catheter three or four times daily, to remove the urine completely, and at least to offer the possibility of reacquiring power to the muscular coat, which does not exist so long as that coat remains constantly distended by the retained urine.

Next, for pure atony and for slight paralysis, uncomplicated with prostatic enlargement, a little aid may be sometimes afforded to the patient through the agency of electricity, by cold douches and injections, and by tonics; but less advantage is to be derived from these means, in my opinion, than some have appeared to believe, although I by no means say these are not sometimes serviceable. I have seen an increase of expulsive power attained rapidly during the daily application of an electro-magnetic current to the bladder, and in the following manner:—To one pole the ordinary handle and moist sponge are attached, which is placed over the lumbar vertebræ; an elastic bougie, containing a conducting wire, and tipped with metal, is attached to the other pole, and is introduced into the bladder. A weak current is set going, and its effects watched. Thus a slight sensation only is to be produced. Move the bougie about gently in contact with the walls of the bladder, the urine having been just withdrawn; and, finally, let it rest a little in the neck of the bladder, where greater discomfort is felt; in all allowing the current to pass for eight or ten minutes before withdrawing.

A very different condition to that just described sometimes results after severe lesion, and also after local injury—viz., inability on the part of the bladder to act in any way as a reservoir. In this unfortunate situation the urine leaves the organ by the urethra as fast as it enters by the ureters. This is complete incontinence, in the true sense of the term. Little else than mechanical contrivances are of any avail. And these consist in making a reservoir outside instead of inside the body; one which can be emptied at the patient's will. Happily such cases are very rare.

But there is a partial incontinence which is very common, and which is, moreover, amenable to treatment. You will be consulted by an anxious mother who, bringing her boy or a girl of any age below puberty and occasionally above that period, tells you that every night, or nearly so, this young person wets the bed. Examples of this are frequently seen in my out-patient room. You know that, in a child with a busy excitable brain, muscular movements occur during sleep of a much more active character than those which usually occur in the adult, or in children of more placid temperament. Anything up to somnambulism may take place during sleep in a child whose *physique* is weak, and the slave of a restless, ceaseless activity of mind; and micturition during sleep often occurs in connexion with this state. Clearly, however, not only in such cases; for in some very dull and stupid children, in whom intelligence appears to be below the average, the same thing may happen. And it must also be admitted that there are cases which do not fall into either of these classes. For such unfortunate patients all sorts of remedies and all kinds of management are adopted, including even a periodical employment of the birch—a species of the "cytisus" which I trust you will never admit into your own therapeutic scheme. Depend upon it that "punishment" for this form of youthful frailty will not answer; and whatever of morality may be taught in obedience to the ancient injunction not to spare the rod--a question beyond our province to discuss, —do not regard it as binding on us who practise the healing art. The child's attendants often lose patience at the perpetual recurrence of the disagreeable infirmity, and believe it to be the result of wilfulness or of carelessness. I have seen much cruelty practised, even by the nearest relatives of these unhappy offenders. Give it no countenance whatever.

Now for treatment, briefly, and as much as I can on general principles. For class the first, you will cultivate the physical side of life: remove as much as possible the sources of over mental stimulation; strengthen the constitution through the agency of diet, country air, or sea-bathing if possible, and give steel wine and cod-liver oil. For class the second—those of torpid and deficient intelligence,—you must show the importance of developing mind. Endeavour to call the will into play as much as possible, and enlist it to aid you in preventing the act. These are the children who are usually ill-treated; instead of which they must be made sensible of the degradation of the habit, so as to get a stimulus for volition in relation to it. Here remedies which act specifically on the organs are most appropriate. First and chiefest, belladonna; which apparently paralyses the expulsive muscles of the bladder and the sensitiveness of the organ at the same time. Thus in elderly people who have feeble power to expel the urine, a dose often produces complete retention, and that for some time unaccompanied by consciousness of inconvenience from it. You give small doses, say of the tincture, in the afternoon and evening, increasing gradually when it may be necessary; and if the bladder is thus made to retain the urine all night for a few weeks, on relaxing the dose gradually the habit of retaining is found to be formed and to persist. This remedy is so excellent a one that it has almost superseded blisters to the sacrum and such counter-irritants. After it, nux vomica may be tried. Then, for confirmed cases, after the failure of other treatment, especially for those who have arrived at puberty or thereabouts, a mild caustic solution to the prostatic urethra—say ten grains to the ounce of water—has answered in my hands; to be repeated with a stronger solution if necessary.

In all cases inquire carefully for derangements of digestion, in all its stages, from primary stomach symptoms to worms in the lower bowel—not unfruitful in their adverse influence. Of course you will take care that the child has not too much fluid, nor takes too much of solid food containing much water in its composition, during the latter third of the day; and that it is taken up to pass water late in the evening when its attendants go to bed.—*Lancet, July* 18, 1868, *p.* 69.

40.—TREATMENT OF DIABETES BY PEROXIDE OF HYDROGEN.

By Samuel J. Bayfield, Esq.

A gentleman, aged 46, engaged in commerce, of steady habits, and a moderate liver, suffered from diabetes, for a year and a-half, and had been the whole time under treatment of some of the best practitioners in London, and receiving no benefit, lost both faith and patience, and applied to me; after hearing his statement, and examining his prescriptions, I felt I could not give even feeble hopes of benefit. But it occurring to me that Dr. Gay of Geelong, some time since, published in the Lancet the result of the successful treatment of a case under unfavourable circumstances by the use of the ethereal essence of the peroxide of hydrogen in drachm doses three times a day in distilled water, I was determined to try the effect of the remedy upon my patient. I began with half-drachm doses, and gradually increased to the drachm. I also materially relaxed the rigidness of his diet, and discontinued much that was disagreeable and objectionable for one more consonant to his taste and appetite. I have much pleasure in announcing, after about ten weeks' steady perseverance, with occasional fluctuations, he quite recovered, and has kept well for several weeks; he is now in the country for the benefit of change of air; he is gaining both strength and flesh; and he writes home in a strain both hopeful and thankful. I have not troubled you with daily details, for they would be uninteresting and tedious.—*British Med. Journal, Oct.* 17, 1868, *p.* 423.

41.—SYPHILITIC ALBUMINURIA TREATED BY THE CALOMEL VAPOUR BATH.

By Henry Lee, Esq., Surgeon to St. George's Hospital.

[The patient whose case forms the subject of this article was a tall man, 38 years of age. He was attended at first by Dr. Cumberbatch alone.]

He then suffered from frequent desire to pass his water, which was intensely albuminous. There was great cachexia, anæmia, and debility. He was ordered tonics, and to winter abroad. In February, 1866, he complained of pains in some of his bones. A large soft node formed on the upper part of the forearm, and one of the ribs became carious; a considerable discharge took place from both these situations. There was great prostration, nausea, and loss of flesh.

I met Dr. Cumberbatch in consultation in March, 1866. The patient had then sinuses in the forearm and over the ribs, leading down in both situations to exposed bone. As there was a syphilitic history, although dating from a very remote period, it was thought that the caries had its origin in specific disease; and that the affection of the kidneys might possibly depend upon the same cause. Under this impression, the patient was directed to take a calomel bath every night before going to bed. This he did for eight or nine weeks with great regularity. He took also, at different times, a considerable quantity of sarsaparilla, sulphite of soda, and nitro-muriatic acid. Under this treatment the discharge gradually diminished, and the sinuses soon completely closed. The albumen in the urine remained for a time apparently much the same; it then gradually diminished, and at the end of six months it had entirely disappeared.

This gentleman has again lately been under my care. He had then greatly improved in appearance. His skin was soft and moist; the urine was quite free from albumen; and he had increased in weight.

We were, at the institution of the Clinical Society, forcibly reminded by Sir Thomas Watson of the great gap that exists between the knowledge of certain diseased conditions, and the application of remedies for the cure or relief of these conditions. If it be the principal object of this Society to trace "distinctly and clearly what is the action of drugs and of other outward influences upon the bodily organs and functions," I trust that the case which I have read will be considered one in point. I am aware how difficult it is in any case to say that a patient has been "cured" of his disease. The term, in fact, has by a great many been nearly abandoned. In the last report of surgical patients at St. George's Hospital, four only were reported as cured. Still that there are some remedies which have a great influence in curing diseases, and some diseases which admit of being cured, I do firmly believe; and I think the case which I have related may fairly be said to have been cured by the remedies employed. The principal and most powerful therapeutical agent used was the calomel bath. Of the effects of this mode of treatment I may now claim to have had very considerable experience. One of its great advantages is that all increased action is determined to the skin; and that consequently, irritation of internal organs, whether from the effects of the disease or of the remedy, is thereby counteracted. Salivation can rarely take place when the skin acts properly; and as a matter of fact, I think that I am able to say, when the calomel bath is used in the early stages of syphilis, that the internal organs are very seldom indeed affected.

I know that it has been doubted by some whether calomel, applied in the form of vapour to the surface of the body, is absorbed by the skin. This might be discussed on physiological grounds, but it is with the practical and therapeutical results that we are here concerned. That calomel, as such, enters the circulation, I do not wish to undertake to prove. But that the calomel bath, when properly administered, produces all the therapeutical actions which can be produced by the administration of mercury internally or by inunction, I am fully convinced; and, moreover, that it does so without impairing the powers of the constitution or deranging the internal economy in anything like the same degree.

· The effect of the calomel bath is increased when the vapour is inhaled; in other words, the mucous membrane absorbs more readily than the skin. But when the medicine is introduced into the patient's system by inhalation alone, the results prove very far from satisfactory. I made, some time ago, some comparative experiments upon this point, and I found that the cases which were treated by the inhalation of calomel vapour alone, from one cause or another, all proved unsatisfactory. Where it can be so managed, perhaps the best way is to introduce the mercury through the skin only. This may not unfrequently be done, but the power of absorption through the skin varies very much in different cases. Often the symptoms will disappear without the gums showing any sign of mercurial action; and this will be the case as well with regard to those symptoms which have been previously of long continuance as those which are of recent date. In some cases, where the skin is dry and hard, it has to be softened before any sensible effect is produced either upon the disease or upon the patient's system. Where the skin is already in a good condition, the effects of the baths may be looked for very soon.

A gentleman was some time ago under my care who had for years been in the habit of taking Turkish baths, and otherwise paying great attention to his skin, and, as far as that was concerned, he was certainly in very perfect condition. He had well-marked primary symptoms, and a distinct secondary eruption commencing on the body. He was ordered calomel baths, and his mouth very soon became affected. He then continued the baths occasionally for a period of about three months, taking as much care as he could not to inhale the vapour of the calomel. This gentleman would seldom take a bath on two successive days without an increased effect being visible on his gums. He adopted no other specific treatment. He recovered, and has remained well.

In one of the earlier communications to this society the influence of the skin on the secretion of the kidneys was ably pointed out; and it might be supposed that in the case related the benefit derived may have been due in part to the perspiration produced on the surface. It is not improbable that such may have been the case; but when it is considered that the urine remained intensely albuminous during the whole of the year 1865, and during parts of the years 1864 and 1866, and that it may have been in the same condition for a long time before the patient came under observation, it must, I think, be allowed that a disease here existed which could not be ascribed to any mere functional derangement.

The calomel bath has this additional advantage over other modes of mercurial treatment, namely, that it may be employed in states of extreme debility of the constitution. In the case which I have related no one, I presume, would have thought of giving mercury internally, and very few, if any, would have suggested mercurial inunction.

Since the reintroduction of the calomel bath, it has been used, perhaps, more extensively in some other countries than in England. Dr. Lanesford P. Yandall, a delegate from the Kentucky State Medical Society to the Medical Congress lately held in Paris, was good enough to give me the following particulars of its use, derived from his personal observation. He says: "Fifteen years since my brother, Dr. D. W. Yandall, began the use of the baths. Since that period I have knowledge of about 1500 cases of constitutional syphilis treated by the baths in his practice and my own. We first employed the black oxide of mercury, the red bisulphuret, and the iodide; but for ten years have employed calomel only. We have treated every form of constitutional disease by the fumigation, and (except in a few cases of tertiary syphilis, where mercury had been improperly and excessively used) I cannot recall a case which failed to be relieved. We have frequently found alopecia arrested after the first bath. I believe, as a rule, an improvement may be observed after the third or fourth bath. The ulcerations of the throat then cease to progress, and eruptions on the skin begin to fade. We use a drachm of calomel every night for six nights in the week. We sweat the patient profusely, and keep him in the bath from twenty-five to forty-five minutes. As a rule, a course of baths extends over a period varying from six weeks to two months. I have never seen a patient salivated under these baths. Swelling and tenderness of the gums have been the greatest effects produced. The patients have never lost flesh during the treatment; but have, as a rule, on the contrary, improved in appetite and increased in weight. I remember one patient who in sixty-two days gained thirty-one pounds of flesh. He was profusely sweated six times a week. I have never seen any ill-effects follow this treatment; and, so far as I have been able to keep my eye on the cases, relapses have been *decidedly* the exception to the rule. At the present time I know the whereabouts of probably a hundred persons cured of syphilis by the baths, some as far back as fifteen years, and none of a later date than eight years, who have had no relapse. Some of these patients have since married, and in none of the instances have the wives or children shown any symptoms of syphilitic poisoning. Dr. David W. Yandall was the first to introduce this treatment into the Southern States. At the present time it is the favourite treatment in all the large cities having almost entirely superseded all others. I am sure that its troublesomeness to the medical practitioner is the only obstacle to its universal use."

Such is Dr. Yandall's statement, which I have given in his own words. The quantity of calomel which he uses is considerably more than I have been in the habit of employing, and he also produces a much greater amount of perspiration than I have thought necessary. The degree of perspiration is very much influenced by the amount of water used in the bath. The water acts as a carrier of heat. An amount of heat becomes latent as the water boils, and is given out again as the vapour condenses on the patient's body. The vapour of water is a very important part of the bath. It not only softens and warms the skin, but it prevents the muriatic acid which calomel gives off when heated from irritating the lungs. The want of some convenient means of doing this was probably the reason why the calomel vapour-bath was not long ago brought into general use. But if the vapour of water be in excess, I have thought that it interferes with the action of the calomel, and I therefore direct only just as much to be used as shall produce a slight moisture on the skin, and sufficiently dilute any irritating vapour which may arise from the heated calomel. In some cases the patients will not bear sweating well. In cases of extreme debility, although they may be benefitted by the calomel, yet their weakness is increased by much perspiration.—*Lancet, July* 25, 1868, *p.* 109.

SURGERY.

BONES, JOINTS, ETC.—AMPUTATIONS, FRACTURES, DISLOCATIONS.

42.—REDUCTION OF DISLOCATION OF THE SHOULDER-JOINT BY MANIPULATION.

By Dr. James Pitcairn Bookless, Kelso.

Having read, with considerable interest, an article in the number of this Journal for May 1867, by Mr. Annandale, Lecturer on Surgery, &c, "On the Reduction of Dislocations of the Hip-Joint by Manipulation," I determined at that time to try what seemed so simple a method of operation whenever an occasion should present itself. Since then I have successfully treated various dislocations, principally of the shoulder-joint, and in them all put in force the usually received plans of reduction. Somehow I had not courage enough to try "manipulation" in any of those cases; but lately, an occasion offered where I *did* employ this method, with such success, that I have made a few notes of the case, in the hope that they may be of use in inducing others to substitute for the harsher methods of reduction a plan which, leaving out the question of chloroform, and according to the testimony of others than myself, is so simple, so speedy, and at the same time so sparing of agony to the sufferer.

On the afternoon of December 20, 1867, I was summoned to the country to attend a man who, according to the messenger's story, "had knocked his shoulder-blade out of joint." On arriving, I found upon examination that my patient, a stout strong man of about fifty years of age, had dislocated his right shoulder downwards, eight hours before, from a twist he had received by the act of pulling up a horse on the verge of falling. He was suffering great pain and there was considerable swelling of the arm. I immediately sent out to procure the assistance of some labourers in the field, so that they might be at hand in the event of my not succeeding with the method I intended to adopt, viz., "the heel in the axilla." My patient and I meanwhile were left alone, and I could not resist the temptation to try the plan I had so often thought of pursuing.

We both stood in the middle of the room, side by side, in a position where our right shoulders almost touched each other—so that, while my patient looked "eyes front," I looked in the contrary direction. I now seized his right hand with my left, at the same time separating his arm from the side. I then passed my right arm underneath his axilla—hugging the humerus. While I placed my right leg behind his right leg, I brought his hand underneath my right arm with my left. I now raised the humerus forcibly upwards with my right, and bent his elbow under the same arm, pressing downwards. At the same moment I directed him to fall away from me with his whole weight, and in a moment, crack went the head of the humerus into its proper place. The operation scarcely lasted one minute; and so sudden had been the transition from agony to joy, that he laughingly informed me, that "it was just like gettin' a *teeth* drawn, but no half sae sair." The surprise of the good woman of the house and her followers, who rushed into the room in a violent hurry, ten minutes afterwards, can be better imagined than described.

The position to an onlooker is exactly that known by the name of the "bend" in the wrestling world, where you try to throw your opponent—failing in which you go yourself; the only difference being in this case, and that a most important one, that the operator is the only one trying to throw, as it were, so that, whether he succeeds or not, nobody falls.

Viewing this method of reduction as an example of a lever of the first order, the operator's left hand, with the assistance of the patient's body, forms the power; his right arm hugging the humerus. the fulcrum; and the head of the humerus, combined with the forces which retain it in its unnatural position, the weight.—*Edinburgh Medical Journal, June* 1868, *p.* 1103.

43.—AMPUTATION AT THE KNEE-JOINT.

By Dr. J. Brinton, Philadelphia.

[The following article is an abstract of one published in the American Journal of the Medical Sciences (April 1868). A distinction is to be made between amputation at the knee and amputation at the knee-joint.]

In the latter, the femur is sawn through above the articulation; whilst, in the former, the condyles, and sometimes the patella, are retained with their incrusting cartilages—an important modification just performed in England by Mr. Lane, of

St. Mary's Hospital, and afterwards by Sir W. Fergusson, Mr. Coulson, and others. The whole number of recorded cases of amputation at the knee-joint during the American war was 211; of these, 96 recovered, 106 died, and the results in 9 were undetermined. Reamputation of the thigh was resorted to in 12 cases, in 8 successfully, and in 3 fatally. The average mortality of the whole number of cases is thus 50·2. The mortality of thigh-amputations performed during the same period was 64·43 per cent. The following are the chief results of amputation at the knee-joint in American civil practice. The total number of cases was 64, of which 7 were under the care of Dr. Brinton; primary amputations after accidents, 24 cases, with 16 recoveries and 8 deaths; secondary amputations after accidents, 20 cases, 13 recoveries and 7 deaths; secondary amputation for disease, 18 cases, 15 recoveries, and 3 deaths. The mortality was thus 28 per cent., that of European practice being 27·65 per cent.; since, in 47 collected cases, there were 34 recoveries and 13 deaths. The mortality for thigh-amputations is in America about 41·4 per cent.; in Paris, 62·6 per cent.; and in Great Britain, from 50 to 70 per cent. The death-rate from amputations of the leg below the knee is about 35 per cent. The diminished mortality of amputation at the knee, compared with removal of the limb above or below the joint, is attributed by Dr. Brinton to diminished shock of operation, which is a marked feature of the operation; to the nature of the tissues involved, and the small extent of the suppurating surface; and, finally, to the fact that the shaft of the femur is not sawn across. Dr. Brinton's experience in military practice has convinced him that, in all amputations in continuity, the patient's immunity from osteo-myelitis and subsequent pyæmic poisoning is greatly influenced by the point at which the saw is applied. The nearer to the centre of the bone this is done, the greater, probably, will be the chances of inflammation and disastrous sequelæ. In writing of the danger of amputation at the knee-joint, Dr. Brinton asserts that subsequent synovial inflammation, which is feared by some operators, is in reality but an imaginary peril. One serious condition of occasional occurrence is inflammation of the tendinous sheaths of the biceps, sartorius, semimembranosus, semitendinosus, and gracilis muscles, which is rapid in its course, and leads to suppuration. In all the operations which have come within Dr. Brinton's observation, the result as to value of the stump has been favourable. "There is seldom any tenderness on pressure; the patient generally bears his weight freely upon the end of the stump, and can use an artificial limb with ease and comfort."—*British Medical Journal, August* 29, 1868, *p.* 223.

44.—ACUTE SYNOVITIS OF THE KNEE-JOINT; SUPPURATION; TREATMENT BY CARBOLIC ACID.

By Dr. T. Hamilton, Canonbury, London.

On Monday, the 22nd of June last, I was called to see I. M., a young woman aged 22. She told me that whilst at work three days before she was seized suddenly with pain in her left knee, which swelled soon afterwards Since then the pain and swelling had increased. I found the joint much swollen and red, with distinct fluctuation on each side. Ordered hot fomentations and rest. During the next three days she continued in much the same state.

On Friday, June 26th, as suppuration had evidently taken place, having previously dipped the knife in a strong solution of carbolic acid, I evacuated between six and eight ounces of pus, by incisions about an inch and a half long, on each side of the joint. I allowed the matter to escape under what Mr. Lister has termed the antiseptic veil. A paste of carbolic acid, linseed oil, one part to three, and whiting, was applied to the wounds on lead paper. (I could not obtain tin-foil.) Slight pressure was placed on the sac of the abscess by two pads of lint on each side of the joint with a bandage.

Next day I found the patient free of all pain. Pulse 80. Had slept well. On removing the dressings, a little bloody serum escaped, but no pus, and since then none has come from the wounds.

For the next four days I applied the carbolic paste, but each day weaker.

July 1st. Swelling entirely gone. No pain. No discharge. Wounds superficial, and nearly healed. Slight excoriation of the neighbouring cuticle, from the action of the carbolic acid, for which I applied water dressing.

This case requires no comment. The rapid cure was, without doubt, due entirely to my having adopted the plan of treatment suggested by Professor Lister; and I would venture to say that under no other form of treatment at present employed would so satisfactory a result have been obtained in six days from laying open the joint.

To-day (July 2nd), though I still keep the joint comparatively at rest, the patient can move it freely without the least pain.—*Lancet, July* 11, 1868, *p.* 40.

45.—ON THE ANTISEPTIC SYSTEM OF TREATMENT IN SURGERY.

By Joseph Lister, Esq., F.R.S., Professor of Surgery in the University of Glasgow.

[The mere use of carbolic acid as a dressing to a wound has long been practised in many parts of the world. By the antiseptic system of treatment is meant the systematic employment of some antiseptic substance, so as entirely to prevent the occurrence of putrefaction in the part concerned.]

So far from carbolic acid being a specific, it owes its virtues to properties which it possesses in common with various other substances; and results similar in kind to those obtained by its means might be got by disinfectants long familiar to British surgery, provided always that the same principles guided their employment. This statement is not made on theoretical grounds alone. About nine months after I had first treated compound fracture with carbolic acid, Mr. Campbell De Morgan published a paper "On the Use of Chloride of Zinc in Surgical Operations and Injuries," and was kind enough to send me a copy of it. By means of this salt he had obtained highly satisfactory results, though led to employ it with a very different object in view. Mr De Morgan used chloride of zinc in the first instance in cases of cancer, upon the idea that the frequency of return of the disease after operation might depend on the dissemination of its germs on the cut surface, and he hoped that, by applying a strong solution of the chloride to the wound so as to destroy any cancer-germs that might be scattered over it, he might diminish the chance of recurrence. Having treated cases of cancer in this way, he found that the wounds healed unusually kindly, while there was, at the same time, an absence of "animal odour," and he expressed his surprise at the small amount of "action" in the part. To myself it appeared perfectly natural that, if chloride of zinc prevented animal odour, implying that putrefaction was avoided, the wound, protected from the irritating influence of the products of decomposition, should exhibit little inflammatory disturbance. But it struck me as very remarkable that a single application of chloride of zinc to the raw surface should have the effect of preventing all odour of putrefaction for days afterwards; for I knew that in the case of carbolic acid a renewal of the antiseptic to the exterior was essential in order to prevent decomposition. Hence it appeared likely that chloride of zinc would answer better for my purpose than carbolic acid, and I determined, on the first suitable occasion, to give it a trial. It was not long before an opportunity presented itself.

Case of Compound Fracture Treated with Chloride of Zinc.—A labourer was admitted into the Infirmary with compound depressed fracture of the *os frontis*, caused by violent impact of the handle of a winch. I applied chloride of zinc solution thoroughly to the interior of the wound, and, with the view of preventing the spreading of decomposition inwards, adapted to the forehead a plate of clean block tin overlapping the sound skin for a considerable distance, a means which, as I had before ascertained, prevents the occurrence of putrefaction in the discharge from a healthy granulating sore. The tin plate was kept in position by a piece of strapping, and over all was laid a damp folded rag to absorb discharge, with directions that it should be frequently changed. The tin was not disturbed till about a week had expired, the patient meanwhile remaining free from any unfavourable symptoms, and not a drop of pus appearing. On removing the plate of metal, I found that the wound, instead of being hollow as when I had last seen it, was on a level with the surface of the forehead, being occupied by a chocolate-coloured mass which I supposed to be a clot, altered by the action of chloride of zinc. But when I scraped the surface of this material it bled, shewing that it was in reality alive and vascular. This exactly corresponded to the most striking and peculiar of the results I had seen to follow the use of carbolic acid in compound fracture (see the Lancet, March 16th, 1867), and the most likely to be mistaken for the effect of a specific action of that substance, viz., that the blood acted on by the antiseptic, though greatly altered by that action, remained susceptible of organisation. Or, speaking more strictly, the product of the action of chloride of zinc upon the blood, like that of the operation of carbolic acid upon it, so soon as the irritating antiseptic material with which it was at first imbued had been withdrawn from it by diffusion into the surrounding circulation, proved a suitable pabulum for the growing elements of living tissue in the vicinity, which accordingly absorbed and appropriated it.

In the case just related, nothing could be more satisfactory than the effects of chloride of zinc. Subsequent trials, however, proved it to be very inferior to carbolic acid except in one class of cases, those, viz., in which, from the circumstances of the part concerned, it is impossible to maintain an efficient external antiseptic dressing, so that the application must be made once for all at the time of the operation. Here the permanence of the effects of chloride of zinc renders it highly valuable, as, for example, after the removal of portions of the maxillary bones. Every surgeon is familiar with the highly offensive character of the discharge for the first few days after such operations ; and there can be no doubt that the fœtid state of the wound, besides being a great inconvenience to the patient and his attendants, involves a certain amount of danger. By means of chloride of zinc this complication is nearly, if not entirely avoided. In the first case of this kind in which I used it, I had to remove a considerable portion of both superior maxillary bones, on account of epithelial cancer which had spread to them from the face. I applied the chloride of zinc solution freely to the raw surfaces at the time of the operation, and afterwards examined the breath daily, when the only smell perceptible from first to last was an occasional odour of tobacco. [Since this address was delivered, I have used chloride of zinc with great advantage after the removal of the tongue by Mr. Syme's method, in a case of epithelial cancer.]

But in ordinary cases carbolic acid is very superior to chloride of zinc, and, so far as I am able to judge, to any other antiseptic agent with which we are at present acquainted. It presents, indeed, a remarkable combination of advantages. In the first place, it possesses the essential requisite of being a most potent poison for the low forms of life which determine putrefaction, and it retains this power even though diluted to such a degree as to be almost entirely unirritating to the tissues of the human body. In the second place, it is volatile, and its vapour is quite efficacious as an antiseptic. This gives it a great advantage over chloride of zinc or any other non-volatile substance, enabling the dressings impregnated with the acid to exert their influence not only upon objects in actual contact with them, but also upon the air in their vicinity. Again, carbolic acid is a local anæsthetic, and exercises a most soothing influence upon a painful wound. Lastly, carbolic acid is soluble in a variety of liquids of very different properties, so different, for example, as water and the fixed oils; and each of these solutions has its own special value in practice, a point to which I shall have occasion to allude further on in this communication.

Case of Penetrating Wound of the Thorax and Abdomen.—On the 1st of October last, a butcher, aged 18, was admitted on account of a most serious wound of the chest, inflicted by a comrade who, angry at having a dirty bladder thrown at him by the patient, threw in return his knife, with a blade nine inches long, and keen-edged, half of which buried itself in the patient's infra-axillary region, between the ninth and tenth ribs. He himself drew out the knife, which was followed by a fearful gush of blood. Being accustomed to see blood flow, he said "there was a spout of four inches before the fall." He was immediately taken to the hospital, where my then house-surgeon, Mr. Hector Cameron, found him blanched, his clothes drenched with blood, which was still pouring from the wound, venous in colour, and with a tendency to regurgitate during inspiration, implying that it proceeded from a wound in the lung, which was further indicated by the occurring of hæmoptysis. There was also protruding from the external wound a piece of omentum five inches long, shewing that the knife had passed through the diaphragm into the abdominal cavity. No time was to be lost, as death from hemorrhage was imminent;

and Mr. Cameron judged it best to plug the wound, but at the same time to introduce an antiseptic as in compound fracture, in order to destroy any atmospheric germs that might have been drawn in during inspiration. With this object, after cutting off the protruding piece of omentum, which he kept to show me, he soaked a piece of lint with a solution of carbolic acid in four parts of boiled linseed oil, and by means of dressing forceps passed it as far as he could in every direction in the pleural cavity, repeating the application several times. He then took two strips of lint steeped in the same solution, each about a foot long and an inch in breadth, and pushed them into the pleura one upwards, the other downwards, as far as possible consistently with keeping their ends protruding externally; and, the wound being thus plugged antiseptically, he applied a sheet of paste composed of whitening mixed with the oily solution of carbolic acid before-mentioned, taking care that it was large enough to overlap the skin around the orifice by several inches in every direction, retaining it in position by strapping and bandage. It may, perhaps, be said by some of you, "Surely it was heroic practice to introduce irritating carbolic acid so freely into that important serous cavity. Would it not have been a milder and more prudent course to have plugged the wound with a piece of dry lint?" But any one who argues in this way forgets what would have been the inevitable result of such a procedure. The mass of blood accumulated in the pleura would necessarily have been soon decomposed through the agency of the germs contained in the lint; and the putrefying mass, growing from day to day more acrid in the cavity in which it was confined, would undoubtedly have soon caused the death of the already prostrated patient. On the other hand, carbolic acid, being a local anæsthetic, is much less irritating, even when first applied, than the products of decomposition; and it also differs from the latter in this all-important point, that it soon becomes dissipated by diffusion and removed by the surrounding circulation, when, the blood on which it has acted being still amenable to organisation and absorption, the part is as favourably situated as if affected only with a subcutaneous injury. Next day, when I saw the patient for the first time, I cautiously withdrew the plugs, under the protection of a large piece of lint dipped in the oily solution of carbolic acid, and continued the use of the paste. For about ten days the patient progressed admirably, the pulse descending, the laboured rapid respirations growing less laboured and less rapid, and altogether his condition becoming so much improved that he could not be prevented from sitting up in bed, singing songs and conducting himself otherwise in an imprudent manner. Meanwhile, examination of the thorax disclosed signs of the presence of both blood and air in the pleura, such as dulness of the base and preternatural resonance of the upper and anterior part of that side of the chest, and metallic tinkling, which was well-marked. And to such an extent had this accumulation of blood and air proceeded, that the heart had been pushed over towards the right side, so that its apex beat below the right nipple. And yet this mass of blood, freely exposed to the influence of air, had not decomposed. Any putrefactive germs introduced through the external wound had been destroyed by the carbolic acid, and the air, entering the pleura through the wounded bronchial tubes, had deposited its floating organisms upon the slimy mucous secretion of those tortuous canals. Hence the patient remained free from any symptoms of irritation, and suffered only from loss of blood and the embarrassment of the respiration which was the mechanical result of the injury. But, thirteen days after the accident, profuse hæmoptysis appeared, which I was disposed to attribute to tearing open of the wound in the lung through his imprudent exertions; and this, continuing for several days, threatened entirely to exhaust his weakened frame. The expectorated blood assumed also a putrid odour, like that from gangrene of the lungs; and I was apprehensive that the putrescence might spread to the mass in the pleura. Fortunately, however, this did not occur. The bloody expectoration gradually became purulent, and then diminished in quantity till it ceased entirely. With regard to the external wound, it furnished no pus so long as the original mode of dressing was continued. In the first twenty-four hours, there was a free discharge of bloody serum; but this grew less from day to day, till, six days after the receipt of the injury, it amounted to less than a minim in forty-eight hours; and when the piece of lint, which had been kept permanently on the wound beneath the paste, was removed, between three and four weeks after the accident, a superficial sore was found, which afterwards cicatrised kindly. On November 18th, seven weeks after his admission, the apex of the heart was observed to be again beating below the left mammilla; and, finally, I may add, that he was seen a few days ago by Mr. Cameron, engaged with another butcher in driving a herd of unruly cattle through the streets, when our former patient, though still pale from anæmia, proved the more vigorous of the two in turning the animals; while his lusty exclamations, though not couched in the most decorous language, gave satisfactory evidence of the soundness of his lungs.

[In speaking of his mode of dressing Mr. Lister continues:]

Carbolic acid is soluble in liquids of very different kinds, so different for example as water and one of the fixed oils; and each solution has its own special value. Water, having little affinity for the acid, dissolves but a small quantity, only one-twentieth part of the pure crystals, and holds that small quantity very loosely, so as to permit it to act with energy on any substance for which it has stronger attractions, and also to become soon dissipated on exposure. Hence, the watery solution is a pretty potent but transient application. Now, this is exactly what we want when we apply carbolic acid to the interior of a wound for the purpose of destroying any germs which may have been introduced into it. We require something that will act with energy for the moment; but which, as soon as it has extinguished the vitality of the septic particles, may disappear from the wound, in order that the tissues may be left free from all unnecessary irritation. The fixed oils, on the other hand, have so strong an affinity for the acid that they will mix in any proportions with it, and hold it so firmly as not to permit it to act with much energy on the tissues, or to become soon dissipated into the atmosphere. Hence an oily solution is comparatively bland but permanent in its operation. These are just the properties which are desirable for an external application. We wish it to serve as a reservoir of the acid, retaining it for twenty-four hours at least, so that it may remain constantly exerting its antiseptic influence upon the discharges that flow out beneath it. At the same time it is most important that it should be mild in its action on the surface to which it is applied, in order to avoid irritation and excoriation. It appears clear, therefore, that a watery solution is best adapted for the treatment of the interior of a wound in the first instance, while an oily preparation is suited for an external dressing.

We have next to consider the best form for the oily application. I have used various forms; of which some have proved trustworthy, and others not so. One that has shewn itself thoroughly reliable is a paste composed, like glazier's putty, of boiled linseed oil and whitening, but with the addition of about one part of carbolic acid to four of the oil. Even in the case of large abscesses, where there has been in the first instance a profuse discharge, the putty, if properly applied and retained securely in position. prevents with perfect certainty the spread of putrefaction into the interior. But the putty is a somewhat clumsy and inconvenient preparation, and I have been desirous if possible, to get rid of it. Within the last few months I have given a full trial to cloths dipped in a solution of carbolic acid in olive oil, but I am sorry to say that this method, though attractive from its simplicity, is not reliable. It is true, indeed that we have had some beautiful cases under this mode of management; as for example the following.

Case of Compound Fracture of the Right Leg and Severe Contused Wound of the Left Foot, in a Person of Advanced Age.—

On the 31st of January last, a woman aged 74 years, was admitted into the infirmary, having been run over by a heavily laden omnibus. The wheels had passed over both lower limbs, producing in the right leg compound fracture of both bones a little above the ankle, with a considerable wound on the outer side of the limb communicating with the broken fibula, and another on the opposite aspect, not directly connected with the seat of fracture. In the left limb the violence had been sustained by the foot, which presented at its inner aspect a large gaping contused wound, four inches long and two inches broad, while the skin was extensively detached, so that when a watery solution of carbolic acid had been introduced at the wound, pressure over the skin at the outer or opposite side caused some of the fluid to escape, showing that it had passed freely over the upper surface of the foot, beneath the undermined integument. She had also a wound on the forehead, two inches long, exposing the os frontis. From these various injuries she had lost a great deal of blood, and she was also suffering from contusions in other parts of the body. All the wounds were dressed with layers of lint soaked with a solution of carbolic acid in olive oil; the superficial layer, larger than the rest, being changed daily while the deeper layers were left undisturbed. Under this treatment the wound on the forehead healed without the formation of a drop of pus, and those in connection with the compound fracture were converted into superficial granulating sores, without any more disturbance, local or constitutional, than if the fracture had been a simple one; and the bones united in the usual period under the use of pasteboard splints. But the most remarkable circumstance in the case was the progress of the injury of the foot. Three days after the accident, my house-surgeon, Mr. Appleton, observed that a considerable portion of the undermined skin on the dorsum of the foot had lost its vitality; and instead of adopting the usual course of applying wet lint or a poultice till the slough should separate, he extended the antiseptic dressings so that they over-lapped the dead portion of tissue for a considerable extent in every direction; after which, the daily changing of the superficial layer was continued as before. The result, though in strict accordance with the principles which I am endeavouring to enforce, was strikingly opposed to ordinary experience. After the subsidence of the copious sanious effusion which took place immediately after the injury, the discharge became reduced to about one minim in twenty-four hours, without any distinct appearance of pus, while the foot remained free from the slightest uneasiness, so that she moved it as usual in the bed, and imagined it perfectly recovered. Such being the case, knowing as I did, that to remove the deep dressings would be to induce, at the best, two large granulating sores which must, from that time forward, furnish a considerable amount of pus that would act as a drain upon the old lady's feeble system, I left the crust of lint and dried exudations untouched for seven weeks, at the end of which time it became spontaneously detached. On raising it, we found a narrow line of cicatrix along the inner side of the foot, complete healing by scabbing having occurred in, I suppose, the largest wound ever known to heal in that manner in the human subject. And on the dorsum of the foot, in place of the large slough, was a broad scar, a portion in the centre about as large as a fourpenny piece alone remaining unhealed; the dead tissue having, apparently, been absorbed, as none of it was found on the dressing. The superficial layer of antiseptic lint daily renewed, had answered the purpose of preventing putrefaction from spreading inwards, while the thickness of the permanent crust had kept the carbolic acid constantly supplied externally from penetrating to its deepest parts. Hence, the portion of the dressing in contact with the skin, having lost its original acid by diffusion into the circulation, before sufficient time had elapsed for granulation and suppuration to take place under the stimulating influence of the antiseptic, became a perfectly unirritating or neutral body, and the dead portion of tissue beneath it, being in like manner destitute of any stimulating properties, became amenable to absorption, like the bit of the external coat in the noose of the antiseptic ligature, or the dead bone in the case of necrosis, above related.

But, while I have mentioned this case as a good example of the behaviour of severe injuries under antiseptic management, I wish it to be distinctly understood that I do not recommend the mode of dressing adopted. For, as I have already stated, and as bitter experience in some other cases has but too clearly convinced me, it cannot be implicitly relied on. The reason why it is less trustworthy than the putty is sufficiently plain. The lint, being porous, absorbs the discharge, which, as it enters, displaces the antiseptic oil, and may thus, if profuse, establish a channel of putrescible materials from the external atmosphere to the wound. Again, when the discharge has passed through the dressing, even though it have been imbued with carbolic acid in its passage, it gives it off into the atmosphere on exposure, when it becomes again liable to putrefaction, and, having putrefied, may soak back into the porous dressing, and deprive it entirely of antiseptic virtue. For carbolic acid and the products of putrefaction exert a powerful chemical action upon each other; and, on this account, the former is a deodorant as well as an antiseptic, and, conversely, the latter, if in sufficient quantity, neutralise the acid and render it inert. In this way, I have known a dressing, consisting of several layers of the oiled lint, lose all odour of carbolic acid and acquire that of decomposition within twenty-four hours of its application.[*] The putty, on the other hand, being impermeable to the discharge, retains the carbolic acid securely stored up, except in so far as it is exhaled from the surface to maintain a constant antiseptic action upon the blood, serum, or pus, that flows out beneath.

Impermeability to a watery fluid being thus evidently the essential cause of the superior efficacy of the putty, the chalk, which is its chief constituent, being of no other use than to give consistency to the mass, it naturally occurred to me that, if the oily vehicle of the carbolic acid were in a solid form, the chalk might be dispensed with, and the advantages of the putty might be obtained in a less bulky and more convenient form. I tried, in the first place, various kinds of *emplastra;* but these appeared objectionable on account of their adhesiveness, which is greatly increased by the admixture of carbolic acid, and which seemed likely to be michievous by retaining the discharge. I next employed paraffine, mixed with a little wax to give it tenacity, and a little olive oil to confer the requisite softness. This certainly made, under ordinary circumstances, an effective as well as elegant substitute for the putty, being perfectly devoid of adhesiveness, while a comparatively thin layer proved secure by antiseptic. But the paraffine cerate had this great disadvantage, that, in situations where it was subjected to much movement, such as the groin, it was apt to crumble down and become useless. Meanwhile I learned that Dr. Watson, of Edinburgh, was employing soap-plaster mixed with carbolic acid, and that, though adhesive, it appeared to work well; the discharge finding its way out beneath it. Thus I was again induced to try *emplastra;* and of late we have been using what seems to answer admirably; viz., *emplastrum plumbi* mixed with one-fourth part of bees-wax to give it sufficient consistence, the carbolic acid being in the proportion of about one-tenth of the whole.[†] This is used as a plaster spread on calico in a layer of about one-twentieth of an inch thick, and I can recommend it as thoroughly reliable. There is a case which I am dressing with it at the present time, which I may mention on account of its interest otherwise.

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[*] If fresh oil is assiduously supplied at short intervals by night as well as by day, this objection to oily cloths as a dressing is removed. But this would in many cases be impracticable; and, as a general rule, it is obviously undesirable, from the trouble and uncleanliness involved in it. There are situations, however,—such as the perineum,—in which this is probably the best mode of management And it may be added that, in any case where the discharge is very trifling, oiled lint, changed once in twenty-four hours, will prove sufficiently reliable.

[†] In making the plaster with the ingredients mentioned in the text, the emplastrum plumbi and the bees'-wax are melted and mixed together, and allowed to cool, till the liquid begins to thicken; the carbolic acid is then added and stirred in, which has the effect of bringing back the mass into the state of a thin liquid, which is assiduously stirred till it thickens, to prevent the wax from separating in granules This plaster is, however, inconveniently soft, and cannot be kept spread in stock. I have since found that by increasing the proportion of litharge, the lead-soap may be made of any degree of firmness that may be desired, provided that water be not used in the manufacture. When the

Case of Old Fracture at the Ankle with Fixed Displacement of the Foot, Rectified by Aid of the Antiseptic System.—A young man, aged 29, was engaged in mooring a vessel on the 11th December, 1867, when one of the massive ropes, used for the purpose, slipped and struck him with violence at the outer and posterior aspect of the ankle, fracturing the fibula about two inches above the joint, and breaking off the internal malleolus at its base, driving the bones of the leg forwards and inwards with respect to the foot, or, in other words, producing displacement of the foot backwards and outwards. Four months after the receipt of this injury he came under my care in the infirmary, with the heel very prominent and the foot greatly everted, and firmly fixed in its abnormal position by osseous union of the fragments. In this condition the limb was absolutely useless, and the question arose whether anything could be done to restore it. It was clear that the foot could not be replaced without breaking through the "callus" which could be plainly felt in both bones, and there seemed no prospect of being able to do this without cutting down and adopting means which, in the case of the tibia, would necessarily involve opening into the articulation, or producing artificially a compound fracture into the ankle joint. This I certainly should not have dreamed of doing without the aid of the antiseptic system, being well aware of the disastrous course such injuries commonly run under

litharge and olive oil are in the proportions directed by the *Pharmacopœia*, a certain quantity of water must be added to promote the combination of the fatty acids with the oxide of lead, and even then the process is a very tedious one. But it is an interesting fact chemically, that if the litharge is used in about four times the pharmacopœial proportions, although no water be employed, the combination proceeds under a brisk heat with great rapidity. It is upon this fact that the following method of manufacture is based.

> Take of olive oil, 12 parts by measure; litharge (finely ground), 12 parts by weight; bees-wax, 3 parts by weight; crystallised carbolic acid, 2½ parts by weight.

Heat half the oil over a slow fire; then add the litharge gradually, stirring constantly till the mass becomes thick or a little stiff. Then add the other half of the oil, stirring as before till it becomes again thick. Then add the wax gradually till the liquid again thickens. Remove from the fire and add the acid, stirring briskly till thoroughly mixed. Cover up close and set aside, to allow all the residual litharge to settle; then pour off the fluid, and spread upon calico to the proper thickness. The plaster made in this way can be spread by machine, and kept rolled up in stock; and, if in a well fitting tin canister, will retain its virtues for any length of time. This I believe to be the most perfect form in which an antiseptic lead-plaster can be obtained. It is supplied at a very moderate price by the New Apothecaries' Company, Glassford Street, Glasgow. For almost all purposes, however, it is superseded by the lac plaster, which will be found described in the succeeding part of this address. These improvements in the materials for dressing have occupied a much longer time than I had anticipated; and have been the cause of the delay in publication.—J. L.

ordinary management. If I had operated at all, I should have made a point of removing the end of the tibia, and even then I should have felt that I was subjecting the patient to some risk. But feeling confident that I had the means of converting a compact fracture into a simple one, I did not hesitate to adopt the following procedure. On the 11th inst. (April 1868), the man being under the influence of chloroform, I made a curved incision behind and below the prominent end of the tibia ; and, a solution of carbolic acid in about four parts of olive oil being dropped into the wound during the progress of the operation, I detached the soft parts from the bone sufficiently to enable me to insinuate behind the callus one blade of a pair of cutting pliers, smeared with the same oil, and then having placed pieces of lint, soaked with the oil, around the blades of the pliers, so as to prevent the chance of septic air entering the joint when the bone should give way, divided the callus, and at at once covered the wound with the antiseptic lint. I then made a longitudinal incision over the seat of fracture in the fibula, and divided it with similar precautions. Having thus overcome the obstacle presented by the bones, I proceeded to draw the foot towards its proper position by pulleys acting upon its outer and posterior part through the medium of a skein of worsted passed round it, while a padded belt supported the opposite aspect of the leg above the ankle : the wounds being kept carefully covered with the oiled lint. When a considerable amount of force had been used there was a sudden sensation of something giving way ; and now, on removing the apparatus, the foot was found to have resumed its natural place. The wounds were then dressed with layers of lint soaked with a weak oily solution of carbolic acid, and covered with the antiseptic plaster ; after which, a Dupuytren's splint was applied at the inner side of the limb to prevent eversion, and Mr. Syme's horse-shoe splint anteriorly to obviate the tendency to displacement backwards. Fresh plaster has since been applied daily ; and the result has been that, while the foot has retained its position satisfactorily, the patient has not suffered at all either locally or constitutionally, during the six days that have elapsed since the operation. His pulse has remained 68 or 70, he has not lost his sleep a single night, his tongue has been quite clean, and his appetite good. In fact, he has taken his food with better relish than before, because he has been freed from his previous gloomy prospect of hopeless lameness, while the operation has caused him no anxiety ; as the assurance which I felt justified in giving him, that it was entirely free from danger, has been confirmed by the absence of pain or other annoyance. The discharge which was sanious and copious in the first instance, has of late been only about three minims of clear serum in twenty-four hours; and judging from our previous experience with compound fractures, there is every reason to expect that in a few days more it will cease entirely.

[The subsequent progress of the case has been, on the whole, very satisfactory. But, for reasons to be soon referred to, healing by scabbing did not take place as was anticipated. The discharge, instead of drying up, showed rather a disposition to increase, and assumed a somewhat puriform character; and, although the renewal of the superficial plaster once in two or three days did not involve much disturbance of the limb, I thought it best to expose the wounds when sufficient time had passed to ensure the secure coalescence of their deeper parts. Accordingly, on the 1st of May I removed the lower portions of the dressings, disclosing two superficial granulating sores, with very prominent granulations which explained the want of disposition to cicatrise. These, though treated with astringents, proved rather indolent, so that they were not completely healed till the 4th of June, though the bones were firmly united a fortnight before.

When he was allowed to walk, though he placed the sole fairly on the ground, he experienced inconvenience from a contracted state of the sural muscles, produced by the long continued displacement of the foot backwards and consequent downward pointing of the toes, so that he could not bend the ankle beyond the right angle at which it had been maintained since the operation. I hoped that this inconvenience would be overcome by exercise; but in this I was disappointed; for though his power of walking improved, it was by no means satisfactory. It also appeared that the abnormal position of the foot had led to an exaggeration of the curve of its arch, to such an extent as to make the foot half an inch shorter than the other, while the plantar fascia was felt as a rigid band. I therefore divided that fascia and the tendo Achillis subcutaneously on the 26th of July, and this had the immediate effect of restoring the foot to its natural length, and permitting the ankle to be bent at an acute angle. Had I the case to treat over again I should perform the tenotomy at the same time as the main operation. But except the loss of time that has occurred, the result is nearly all that could be wished. Under the use of a Scarpa's shoe he has continued to improve steadily, and when I last saw him, in the early part of September, he could walk firmly and well, and complained only of some remaining stiffness of the ankle.]—*British Medical Journal, July* 18, *and Oct.* 31, 1868, *pp.* 53, 461.

46.—A SUPPOSED PSOAS ABSCESS OPENED IN MR. LISTER'S METHOD.

Case under the care of Mr. CHRISTOPHER HEATH, at University College Hospital.

The case was that of a young woman who was sent to the hospital to have a psoas abscess opened. She was the subject of angular curvature of the spine, and on the inner side of Scarpa's triangle there was a soft fluctuating swelling, which received a distinct impulse on coughing, and increased in tension when pressure was made between the umbilicus and Poupart's ligament. No doubt was therefore entertained about the diagnosis. The operation was performed in strict accordance with Mr. Lister's directions; the knife was dipped in carbolic acid, and after the fluid had escaped a pad of lint soaked in carbolic acid and oil was immediately applied. The contents of the tumour proved not to be purulent, but consisted of serous fluid tinged with blood. The result of the treatment by the carbolic acid was most successful, no inflammatory action being excited, and no pus formed. As the fluid is gradually accumulating again, it is proposed to repeat the tapping with the same precautions.—*Medical Times and Gazette, July* 4, 1868, *p.* 5.

ORGANS OF CIRCULATION.

47.—ON TORSION OF ARTERIES.

By Dr. G. M. HUMPHRY, F.R.S., Surgeon to Addenbrooke's Hospital, Cambridge.

[The principle of torsion and of the ligature is the same, namely the rupture of the brittle inner and middle coats of the vessel by a force which leaves the tough outer coat unimpaired. By the ligature the coats are divided evenly and cleanly, by torsion the division is irregular, and is more properly a laceration.]

Entertaining so high an opinion of the ligature, I was long unwilling to resort to any other plan. Still, I could not be insensible to the importance of improving our treatment of wounds, and to the effect which the ligature threads and the strangulated portion of tissue included in each knot must have in preventing immediate union of the divided surfaces. Accordingly, as I stated in a lecture a year ago, I was induced to try the plan of acupressure proposed by Sir James Simpson, and was able to report favourably of it, inasmuch as no hemorrhage occurred in any of the cases in which I used it, and the wounds did well. Still, as I then said, I hoped some better plan would be found out, for the presence of the needles in a wound, even for a short time, is objectionable; and their removal, just when a patient is beginning to recover from the effects of an operation, and is peculiarly sensitive to any impressions and apprehensive and distrustful of our intentions, I found to be a source of annoyance; and I was anxious to find some effectual means of arresting hemorrhage without the necessity of leaving any foreign body in the wound. After thinking, therefore, a good deal on the subject, and reflecting over various modes in which the end of the vessel could be temporarily sealed, I tried the plan of torsion, which has of late been used in Edinburgh and elsewhere, and have employed it now in a great many cases, including amputation in the thigh,* in the leg, and many others. Indeed, for several months I have used no other means but torsion for arresting hemorrhage; and it has answered perfectly in all the cases. There has, I think, been less pain after the operations than was experienced when we used the ligature; and the wounds have, on the whole, done better and healed more quickly. In such an operation as excision of the knee, it is especially important to prevent bleeding from the various small arteries that are divided; for unless this be carefully done, blood will collect in the wound, between and behind the bones, after the patient is in bed, will lead to suppuration, and be a source of much trouble. To prevent this evil, I sometimes found it necessary to tie several vessels; and the presence of these ligatures with the portions of tissue strangulated by them was certainly a disadvantage. In the last two cases in which I have performed this operation, I have gladly availed myself of torsion of the arteries, and have been well satisfied with the result. Still, a greater number of cases of this and other operations are necessary, to test properly the value of this mode of closing the arteries. The plan which I adopt is, as you are aware, for the smaller arteries, to use a pair of clasp-forceps, which, at the end, are rather broad, and provided with fine interlocking blunted teeth, by means of which the artery is held securely during the twisting. This I continue till the coats are quite torn through, and the forceps are thereby set free. In the case of the larger arteries, I found, by experiment on the dead body, that these forceps divided the coats of the vessel, and tore their way out too quickly; so that when I injected water into the artery by a syringe it soon, under very slight force, separated and obliterated the folds of the inner coat, which had been caused by the torsion, made its way under the outer coat, and burst through that coat. I tried other forceps of different shapes, and found that the pair of strong narrow-bladed hinge-forceps, which I show you, and which I have been in the habit of using to extract bone in operations for necrosis, answered the purpose better than any others that I have yet used. They resemble somewhat strong dressing-forceps; but the handles are large, giving good purchase, the blades meet closely, and the transverse ridges and furrows near the ends are well adapted, so that they hold the end of the artery tightly without tearing it. You see when I seize with these forceps the end of this femoral artery which I took from a subject yesterday, hold it tightly and twist it, that, although the forceps are not sufficiently broad to cover and embrace the whole diameter of the artery, yet they hold it firmly and retain their hold till the entire end of the vessel has been twisted off. The remaining part presents a conical twisted end, which unfurls itself to some extent. but not entirely, and remains completely closed. I now throw water into it; and not till I have used considerable force do the compressed folds of the inner coat yield, separate, and permit the water to pass beneath the outer coat, which again is so sealed by the twisting, and so strong, though thin, that it offers considerable resistance before it gives way —a resistance much greater than would be required to withstand the pressure of the blood in the living artery I twist other portions of artery in the same manner. They are all firmly closed. Cutting them open, we find the inner coat more or less lacerated and contused, its surfaces squeezed together and thrown into folds, and held in close contact by the twisted outer coat, which forms coils, terminating in a cone or point at some distance beyond the termination of the inner coat. In some instances, I have found the inner coat detached from the outer by the squeezing that occurs during torsion, and more or less reflected into the artery so as to present its divided edge to the blood-current.

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* Professor Humphry has used torsion to the femoral artery after amputation in the thigh in two cases. The patients were young.

You will, from this explanation and these experiments upon portions of artery (and I have made several observations upon the dead body corresponding with these), understand what takes place when an artery is twisted. The inner thick, elastic coat is thrown into folds, which are crushed or squeezed together so as to block up the channel of the artery; it then gives way, and is torn through, and is held in its position by the outer coat, which resists longer. and undergoes still further twisting and squeezing together of its structures, so that when it is finally torn through, it retains its twisted condition, and continues to exert pressure upon and give support to the inner coat.

I have just had an opportunity of examining a popliteal artery which was twisted in a young man after amputation six weeks ago. It was perfectly closed, was contracted, and surrounded by toughish structure for some little distance. Its internal coat was wrinkled near the end, and showed some traces of ecchymosis.

You have probably observed that the attention to the blood-vessels after operations has occupied rather more time than it did when we used the ligature; and torsion has certainly, in my hands, proved somewhat more difficult than the ligature, requiring more care, more patience, and more perseverance. It is necessary to include the vessel itself in the forceps; for it is useless to twist the surrounding tissues; and it is not always easy, when blood is flowing, to make sure of the exact point from which it flows. Often, therefore, when I have been twisting, I found that my efforts were of no avail, because I had not seized the exact orifice of the vessel. Even when the vessel is seized, the inner coat is liable to slip from between the blades of the forceps, the outer coat only being retained and subjected to the torsion; and this is not to be relied on. When, however, I have been sure of having seized an artery and properly twisted it, I have not known any further bleeding to take place from it; and if it be carefully done, torsion is, I think, a valuable means of securing small and medium-sized arteries, such as the tibials, facial, &c., and by reducing the number of ligature-threads, it will be found to promote early healing of wounds. Whether it will prove to deserve our confidence in the case of the larger arteries, I am not so sure; but I should say that the doubt is founded rather upon what I have found in experimenting upon the dead subject than on what I have observed in the living; and it may be that better appliances and more experience may justify a greater reliance upon its efficiency. The experiments which I have shown you to-day upon pieces of artery, and those which some of you have seen me make upon the dead body, have proved to you that much care is needed in the selection of proper forceps, and in so seizing and holding the end of the vessel that its inner coat does not slip from between the blades during the twisting; and it will have occurred to you that in the living subject it is not easy to make sure of doing this as it should be done, or to feel certain in any instance that the artery has been properly twisted. The only rule I can lay down is to use all the care in the process, especially in grasping the orifice of the artery, and to examine well the remaining torn end after the forceps have been set free by the torsion, so as to ascertain, if possible, whether the vessel is completely closed.—*British Medical Journal, May* 23, 1868, *p.* 502.

48.—ON TORSION OF ARTERIES AS A MEANS OF ARRESTING HEMORRHAGE; WITH EXPERIMENTS.

By THOMAS BRYANT, Esq., Surgeon to Guy's Hospital.

[The following article is an abstract of Mr. Bryant's paper, which was read before the Royal Medical and Chirurgical Society. After some preliminary remarks, he says:]

The two methods by which torsion may be practised were described—the "free" and the "limited." In "free" torsion, the end of the artery should be fixed by a pair of clasp forceps, and twisted freely. In "limited" torsion, the artery, having been drawn out of its sheath, should be fixed transversely about three-quarters of an inch from its divided extremity by a pair of clasp forceps, and held steadily; whilst with a second pair of forceps the free end of the vessel should be twisted freely, as in the former kind. The object of the first pair of forceps being to fix a limit to the twisting of the vessel, and prevent the artery being separated for any distance from its vascular attachments. Three or four complete revolutions of the forceps are enough for small arteries, six or eight for large. The author then passed on to relate his experiments on animals. The first six were upon the carotid and femoral arteries of the dog. In all free torsion had been employed to both ends of the divided vessel, and in all with success. The seventh and eighth experiments were upon the carotid artery of the horse. In these limited torsion was used, and in both with success. In all these instances the animals were subsequently destroyed, and their vessels carefully examined. Special notice was then drawn to the particulars of a case in which the author had applied torsion to the brachial artery, in its upper third, of an old woman aged 68. The torsion proved quite successful, but the patient died from thoracic complications, and this allowed an opportunity of observing the changes the artery had undergone. The physiological conditions of the arteries which had been subjected to torsion then received attention; the results of every experiment were carefully described, and the different points illustrated by drawings and preparations. The results of numerous experiments upon the arteries of the dead subject, both healthy and diseased, were then given, and these went to confirm in every respect the observations obtained from the experiments made upon the living. A careful *résumé* of the physiological effects of torsion was then made. Some remarks upon the experiments then followed, and a comparison was drawn between the effects of torsion on the vessels, and the ligature, and acupressure. Some practical points connected with the application of torsion were then made, and the necessity of employing right instruments enforced. A general summary of the whole subject was then made, and the following conclusions read:—1. That hemorrhage may with certainty be arrested by torsion from even the largest vessels. 2. That it is a safe and judicious practice in all cases in which the vessels are small or of moderate calibre; and that, as far as experiments and practice yet prove, it is equally so in arteries of the first magnitude. 3. That torsion may be "free" or "limited," the free method being applicable to vessels of moderate size, and even to the largest of the extremities, limited torsion being more adapted for the large and loosely connected vessels. 4. That in torsion, as in the ligature, the permanent hæmostatic processes are alike due to the sealing of the divided inner and middle tunics; but that in the ligature there is only an irregular division of these tunics, whilst in torsion there is a complete division, separation, retraction, and valvular incurvation. 5. That in torsion the twisted cellular coat forms, with the retracted and incurved middle coat, the direct mechanical obstacle to the flow of arterial blood, in the same way as the compressed cellular coat does in the ligature, but that in torsion the twisted cellular coat and incurved middle coat become subsequently a permanent means of occluding the end of the artery, whilst the ligature of necessity becomes subsequently a source of irritation, and too often a means of undoing what has been done by nature's own hæmostatic processes. 6. That in torsion the twist in the cellular coat of an artery, the division and subsequent retraction, incurvation, and adhesion of the middle coat, and the coagulation of the blood in the vessel down to the first branch, are the three points upon which its temporary as well as permanent safety depends, whilst the permanent safety of acupressure rests only upon the last point alone, and its temporary effects upon the pressure produced by the needle. 7. That there is every reason to believe that when torsion has been successful on its first application, the fear of subsequent hemorrhage is altogether groundless, for there is nothing, as there is in the ligature, to interfere with the physiological processes set up by nature to occlude the divided vessel, and, unlike acupressure, the temporary obstacle to the flow of blood becomes a permanent one. 8. That upon physiological grounds torsion has decided advantages over the ligature and the acupressure-needle, and that if subsequent experience confirms what has been hitherto observed in the experiments on animals and the application of the practice in the human subject, we shall have gained a point of no mean importance, and simplified Surgery in no slight degree. The paper was concluded by the author stating his belief that the practice was a safe and valuable one in many cases, if not in all; that it was not a crude idea, based upon a theory spun out of a fertile imagination, for it had its origin in observation of nature's own processes; that it was based on the well recognised physiological principles of natural hæmostatics; and that it was artificial only so far as the surgeon's art was employed in rendering these processes most available. Models, drawings, and preparations were freely used to illustrate the subject.

Mr. Christopher Heath thought it incumbent on those who had practised torsion to give their experience. He had amputated a young woman's thigh on the previous Wednesday, and had twisted the arteries, the large ones with two pairs of forceps, and the smaller with one. A tourniquet had been put on loosely as a precautionary measure, and, a little bleeding occurring four hours after the operation, it was screwed up for half an hour, and the bleeding did not return. Mr. Heath had in this case twisted off the ends of all the vessels, as he understood that practice was followed in the North.

Mr. HULKE said that Mr. Syme was in the habit of twisting off the ends of the vessels. He (Mr. Hulke) had tried the plan in cases of small vessels with success.

Mr. JOHN WOOD had in a case of amputation used torsion for the smaller vessels with little or no bleeding. He had applied a ligature to the larger one. Torsion, however, required to be used with very great care, and delayed the operation considerably. He thought that we should not come to a conclusion too quickly with respect to the effect of torsion on the arteries of animals, which were very seldom diseased. In cases of diseased arteries in the human subject, which were not uncommon, he should not trust to torsion.

Mr. SMITH said that Professor Humphry considered that twisting off the ends of arteries was a *sin qua non* in torsion to arrest hemorrhage.

Mr. SPENCER WELLS said that, so far from it being necessary to twist off the end of a divided artery, it was not even necessary to twist at all if the vessel was not of large size. If a small artery was firmly compressed by strong forceps for the extent of about half an inch, the coats of the vessel coalesced, or were mechanically agglutinated together, bleeding being effectually stopped with less injury to the vessel than by torsion. For large vessels compression alone was less trustworthy than torsion; but it might be advantageously combined with torsion, holding the vessel about an inch above the divided end with one pair of forceps, seizing the end with another pair, and twisting the vessel up to the point of compression. In this way the danger of separating an artery from its sheath for some inches above the divided end—a danger almost necessarily incurred if a vessel be twisted six times or more without protection—is avoided. The effect of a very temporary ligature is often sufficient to prevent bleeding from small arteries. It is not necessary even to tie the knot. The silk is passed around the vessel as if to tie it, and by merely tightening the loop firmly the inner and middle coats of the vessel may be so divided and introflexed that bleeding is completely arrested, and immediate removal of the silk is safe.—*Medical Times and Gazette, July* 18, 1868, *p.* 79.

49.—ON LIGATURE OF ARTERIES AND TREATMENT OF NECROSIS ON THE ANTISEPTIC SYSTEM.

By JOSEPH LISTER, Esq., F.R.S., Professor of Surgery in the University of Glasgow, &c.

[It is well known that a needle or spiculum of glass will lie embedded in tissues of the body for an indefinite period provided that they do not cause irritation by their shape. If this is so, why should not a piece of soft silk ligature do the same? Because it contains within it organic germs of putrefaction. Hence it follows that if we can destroy these organic germs the ligature will produce no irritation whatever, and may be left permanently within the body.]

Ligature of the Carotid Artery in the Horse, on the Antiseptic System.—On the 12th of December last, I tied the left carotid of a horse about the middle of the neck, using fine but strong purse-silk, unwaxed, but steeped for some time in a saturated watery solution of carbolic acid. [The product of the action of carbolic acid upon blood serves the purpose of wax in preventing the first half of the knot from slipping during the tying of the second half.] The ligature having been tightly tied, so as to rupture the internal and middle coats, its ends were cut short, and the wound was freely treated with carbolic acid dissolved in forty parts of water. Seven stitches of the coarse soft wire used by veterinary surgeons for the purpose were introduced into the long wound, the most dependent part being left free for the escape of discharge. The hair around the wound was well rubbed with a solution of carbolic acid in four parts of olive oil, and cloths saturated in the same antiseptic oil were applied, over-lapping the surrounding skin freely, and retained in position by means which I need not describe; and similar oil was poured daily upon the cloths for the first six days. Ten days after the operation, I removed the dressings, and found the wound perfectly united throughout, except at the part purposely left open, which was covered with a sort of cheesy material, and as each stitch was removed, there was absence of even serous exudation. The wound was now left exposed, and in three days more the lower part had healed by scabbing, no suppuration having occurred from first to last. At the same time, there was none of the swelling and induration that usually attend the application of a ligature to a vessel in the horse's neck, and the animal showed no signs of uneasiness when the part was freely handled.

Five weeks and four days after the tying of the artery, the creature, though it had improved greatly in condition under its superior diet in the veterinary establishment, died, as the groom believed, of exhaustion from struggling ineffectually to rise from the recumbent posture. I had thus an opportunity of inspecting the parts concerned in the operation, some of which are now before you. In the first place, here is a portion of the skin containing the scar; and you will observe that it is a perfectly sound linear cicatrix, barely traceable among the hair. Here is the artery, slit up to show the condition of the interior. At the cardiac side of the place where the ligature was applied there was, as you see, an adherent coagulum, an inch and a quarter in length. But at the distal side there was no adherent clot, doubtless in consequence of the circulation through a large branch, about as big as the human vertebral, which came off, you will observe, as close to the situation of the ligature as was possible. The *cul-de-sac* formed by the distal end, though it showed indications of the puckering of the divided internal and middle coats, was completely cicatrised, the smooth lining membrane of the artery being continuous over the irregular surface. Why it was that the immediate vicinity of so large a branch did not lead to secondary hemorrhage, was clear from the state of things beside the ligature, which lay embedded in a firm fibrous structure, with not only no pus, but no granulations, no softening of tissues around it. The portion of the external coat included in the noose, though doubtless killed by the violence with which it was pinched, had not been thrown off as a slough, but, being unstimulating, because undecomposing, it had been absorbed and reproduced by the living parts near it; while the thread had been bridged over externally by dense fibrous tissue, so that the vessel showed but little appearance of constriction where it had been tied, and it appears to be as strong at this part as at any other. You may form some estimate of its strength from the manner in which it resists the traction to which I now subject it. Here is the ligature with its short cut ends, apparently unchanged, except that it was divided in my search for it in its fibrous bed.

This case confirms the hope I ventured to express at the meeting of the British Medical Association in Dublin last autumn (see the British Medical Journal, September 21st, 1867) that the antiseptic system would free the delegation of a large artery in its continuity of the two essential elements of danger to which it is now liable, viz., an unhealthy condition of the wound, and secondary hemorrhage. Thus encouraged, I felt justified in carrying a similar practice into human surgery.

Case of Ligature of the External Iliac Artery on the Antiseptic System.—On the 29th of January of this year, I was requested by Dr. Fergus to see a lady fifty-one years of age, who was suffering from an inguinal aneurism which had existed for four years, but had of late been markedly on the increase, causing agonising pain, which had confined her to bed for the last four weeks, and had considerably reduced her strength. The aneurism was of the size of a large orange, affecting the uppermost part of the left femoral artery, and extending a little above Poupart's ligament. Any delay appearing undesirable, I tied the external iliac on the following day, in presence of Dr. Fergus, and assisted by Messrs. Hector Cameron, Appleton, and James Coats. There was nothing peculiar in the operation, except that the incision was made a little further outward than usual, in order to avoid the upper part of the aneurism. The only bleeding vessel that required attention was twisted. The ligature employed had been previously steeped for two hours in strong fluid carbolic acid, prepared by adding a small proportion of water to the crystals. The tightly twisted thread requires a considerable period of immersion to ensure thorough soaking with the liquid; and the acid does not impair the tenacity of the fibre. At the time of the operation, the superfluous acid was removed by transferring the silk to a solution of carbolic acid in thirty parts of water; and the same lotion was used for the sponges, and also for washing the aneurism-needle before it was passed round the vessel. The artery having been tied, and the ends of the ligature cut short, the wound was freely treated with the watery solution, some of which was poured in, to make sure that it penetrated to every part. The edges of the skin were then brought together with silver sutures, except in the middle, where I introduced a pledget of lint steeped in a solution of the acid in five parts of olive oil; passing it deeply, but leaving one end projecting externally, to serve as a drain for blood and serum. I then applied an external antiseptic dressing, the details of which I need not now describe. The pledget of lint was cautiously withdrawn on the following day, under cover of a pretty large piece of lint imbued with the antiseptic oil; and the external dressing was reapplied, and afterwards changed at intervals proportioned to the diminution of the serous discharge, which, at the end of a fortnight, was estimated at about three minims in three days. At this time, some portions of lint, which had been left till then undisturbed, were removed, when the wound was found quite free from pus, being perfectly cicatrised where the sutures were introduced: while the central part, where the pledget was placed after the operation, presented the appearance of a superficial sore, but not a granulating one; for the deep surface of the dressing, being devoid of stimulating properties, had failed to induce granulation in the tissues on which it lay. Meanwhile the patient had been relieved from the pain which she previously suffered, without experiencing febrile disturbance or any material inconvenience from the operation, except uneasiness in the wound the first two days, during retching occasioned by the chloroform.

The tongue had been natural throughout; the pulse had only on one day been as high as 90, 72 to 84 being the usual rates; and her appetite, which had been absent during the four weeks of agony that had preceded the operation, returned two days after it, as soon as the derangement of the stomach from chloroform subsided. On the fourteenth day, as I was arranging her pillows, she sat upright without inconvenience. Four weeks after the operation, the wound being completely cicatrised, she was allowed to move about in her room; and, just six weeks from the date of the ligature of the artery, she descended three long flights of stairs, walked for some time in the streets, and reascended the steps to her lodgings; and, though fatigued by the effort, she felt next day all the better for it. On March 31st, she called to see me, much improved in strength, though with still some tendency to swelling of the legs, especially the left, when in the erect posture. The aneurismal swelling felt merely like a slight glandular thickening. [On July 25th, 1868, I again visited her. She had derived much benefit from a stay at the seaside, and the tendency to œdema of the extremities was greatly diminished. There was still absence of pulsation in the external iliac artery, and the cicatrix remained quite sound twenty-five weeks after the operation; so that, whatever may have become of the ligature, there need be no apprehension of its ever making its appearance externally.]

The success of these cases of ligature depends, as we have seen, upon the circumstance that not only a neutral foreign body, but a portion of dead tissue, if simply protected from putrefaction, is entirely devoid of irritating properties. A good example of this fact is presented by a case at present under my care.

Case of Acute Necrosis treated on the Antiseptic System.—The patient is a boy, eight years of age, who was admitted into the infirmary on Jan. 25th, 1868, having, five days previously, received a violent blow upon the left leg with a heavy pair of tongs, resulting in intense inflammation in the limb, which was red and swollen from the knee to the ankle. Fluctuation being distinctly perceptible over the upper part of the tibia, the matter was evacuated antiseptically. A piece of lint dipped in an oily solution of carbolic acid having been laid upon the part where the incision was to be made, its lower edge was raised to allow a knife smeared with the same solution to be plunged into the cavity of the abscess, when the curtain was at once dropped so that the pus might flow out beneath it. When all the matter had been pressed out, an external antiseptic dressing was applied, and this was afterwards changed daily. Four other abscesses afterwards made their appearance at intervals down the limb. These were treated in the same way; and in every case when a probe, carefully guarded by being passed among folds of lint steeped in the antiseptic oil, was introduced into the incision, it came into contact with bare bone. This was of itself sufficient evidence that portions of the tibia, of greater or less thickness, were dead ; for, had the periosteum been raised by suppuration from living bone, the osseous surface would have become covered with granulations during the process. But evidence which must satisfy the most incredulous is afforded by the fact that, between two and three weeks after the first abscess was opened, a probe introduced into the orifice still passed down to bare bone. Under such circumstances, what, it may be asked, could be the advantage of continuing the antiseptic dressing ? If dead bone was present, whether in larger or smaller amount, must it not become detached from the living osseous tissue by a gradual process of exfoliation, which an antiseptic applied to the skin could neither promote nor hinder ? Such may be a natural inquiry. But having seen a large mass of dead bone absorbed before my eyes by the granulations that enveloped it, in a case of compound fracture treated antiseptically (see Lancet, March 23rd, 1867) ; and having also had evidence from *post mortem* examination in a case of hip-joint disease where extensive necrosis existed in connection with caries, that bone killed by inflammation might, under antiseptic management, fail to induce suppuration ; putting those facts together, I thought it not unlikely that, in the case we are considering, the dead portions of the tibia would be absorbed by the living tissues around them, if we perseveringly maintained an effectual external antiseptic guard. Such, then, was the practice we pursued, and the result was such as I had anticipated. The various incisions successively healed, till by the 6th of this month (April), eleven weeks after the receipt of the injury which caused the attack, the abscess last opened was soundly closed and cicatrised, not a particle of dead bone having come away from any of the openings. At the same time, the swelling of the limb, instead of increasing, as is the case under ordinary treatment, from formation of new bone in the periosteum under the stimulating influence of exfoliations soaked with putrid liquids, had disappeared almost entirely from the upper part of the leg, which was that primarily affected, and was rapidly diminishing elsewhere. [On the 18th of May, the boy left the hospital with the full use of the limb. I had intended giving him a somewhat longer rest in bed as a measure of precaution. But I found that for a considerable time it had been impossible to keep him from getting up and running about the ward ; and he was none the worse for his activity.] This certainly was very different from the tedious course of such cases under ordinary treatment.

With regard to the manner in which the dead bone has been disposed of, some who have not witnessed similar occurrences may doubt the possibility of its absorption, and believe that the necrosed pieces are still lying unchanged in the interior of the leg. But even those who take such a view must admit that we have here a most striking illustration of the important truth, that dead tissue, if protected from putrefaction, is of itself incapable of exerting any disturbing influence upon surrounding parts.—*British Med. Journal, Aug.* 1, 1868, *p.* 101.

50.—ON THE ANTISEPTIC LIGATURE OF ARTERIES.

By C. F. Maunder, Esq., Surgeon to the London Hospital.

The ligature of the larger arteries is an operation of great interest to the surgeon, and of vital consequence to a patient. The operation is often of necessity undertaken under circumstances of unusual risk, and it is especially here that all aids to a successful issue should be imported into the treatment.

I hasten, therefore, to record the fact that less than five weeks ago I ligatured the left common carotid artery, on the antiseptic principle, in a man, twenty-six years of age, and the subject of three surgical aneurisms. The vessel was secured on the plan recommended by Professor Lister, the ligature having been soaked in carbolic acid, cut short, and the wound closed, &c. Scarcely any action was set up about the wound, and in less than a month from the deligation (as I am informed by the patient's medical attendant, who watched the case very closely) the wound had healed, the silk thread did not come away, and he has gone to the seaside. On a former occasion, having ligatured the subclavian and common carotid arteries in the usual way, I mopped out the incisions with carbolic oil, and covered them in with carbolic dressings. Up to the sixth day, when the subject of this double ligature died, almost no action had been set up in the wounds. I quite believe the antiseptic ligature of arteries will greatly diminish the risk of secondary hemorrhage.—*Lancet, Nov.* 7, 1868, *p.* 596.

51.—A SUBSTITUTE FOR THE LIGATURE.

By Dr. N. R. Smith, Professor of Surgery in the University of Baltimore.

I have recently devised a little apparatus as a substitute for the ligature and acupressure in the deligation of arteries. It consists of a small silver tube, and a fine annealed iron wire passed double through the tube and projecting a loop at one extremity. The tube has a small double slit at one end. In applying it, the loop of wire is laid over the bleeding artery; the vessel is then seized with the forceps or tenaculum, and raised. The operator now, holding the tube with his fingers or forceps, seizes the free ends of the wire, and draws them steadily but firmly till the artery is tightly seized by the wire-loop. He now bends the double wire down into the fissure in the margin of the tube, and then gives it one turn around the end of the tube. Then he clips with the scissors the ends of the wire, leaving length enough to be seized by the fingers in removing it.

When the ligature has accomplished its purpose, it is to be removed by seizing the tube with forceps, unwinding the wires, disengaging them from the slit, and then seizing them with pliers and steadily drawing the wire-loop through the canal of the tube, thus severing the artery as by a small *écraseur*.

It may be removed from arteries of the fourth or fifth magnitude in six hours with safety. I have removed it from the femoral artery, after amputation of the thigh, on the second day. In a case in which I applied the apparatus to two arteries, after amputation of the breast, I found them disengaged on the second day, and on touching them they slipped away without the slightest resistance.

The tube is of silver, the wire of iron. Thus there is established (with the artery) a small galvanic circle, which promotes the prompt and firm coagulation of the blood in the artery, and the disengagement of the wire. This I regard as a circumstance of great importance in the *modus* of its action. I should remark that the tube can also be removed by simply twisting it with the thumb and finger. The tube should be of length sufficient to project half an inch or so from the lips of the closed wound.

This apparatus is applied with much more ease than a ligature, as there are no knots to tie, nor any necessity for the assistant to carry his hand around the forceps, which is often disengaged thereby.

Why should not this supersede acupressure? It possesses all its advantages, and does not involve the necessity for wounding the parts anew. I have not yet tried it in the treatment of aneurism, but shall do so on the first occasion. It will be necessary then to carry the wire around the artery, and then to pass the two ends through the tube. The galvanic influence will here be very important in promoting the formation of a firm coagulum.—*British Medical Journal, March* 14, 1868, *p.* 241.

52.—ON THE TREATMENT OF ANEURISM BY IODIDE OF POTASSIUM.

By Dr. George W. Balfour, Physician to the Royal Infirmary, Edinburgh.

Case 1.—*Aneurism of the Aorta.*—Peter Rice, a mason, aged 39, admitted into Ward III. on the 29th April 1867. Patient has never had rheumatic fever, but for the last five years he has been subject to rheumatic pains in his hip, leg, and back, which are generally severe, and are most apt to recur in the changeable weather of spring. He has been in the habit of drinking pretty freely. About twelve months before admission, he fancied that he was overwrought, and when he got home, he found that he could not take a deep inspiration freely; he also felt a sharp pain at a point about two inches to the right, and a little above the left nipple. This pain has continued ever since, and has latterly increased considerably. This pain is stationary at the part described, but when more severe than usual, it spreads upwards to the armpit and shoulder, and down the left arm to the wrist, occasionally extending downwards to the scrobiculus cordis, and sometimes striking sharply through to a corresponding point at his back. It is specially apt to be severe at night, preventing him from sleeping, and is very annoying when it affects his back, as he cannot lie in any other position than supine. He has occasional fits of dyspnœa, and it is always painful for him to take a full inspiration. He has also some difficulty of swallowing. He is much troubled with palpitation, and a distressing feeling of pulsation, and these sensations annoy him most when the pain is severe. At such times, he obtains some relief by relaxing the respiratory muscles, by stooping forwards and leaning against a wall or other support, with his hands and arms extended. About a week ago, his symptoms had increased so much that he was obliged to cease working altogether. His appetite is good; his bowels generally confined. On percussion, the heart seems of normal size; its pulsations are distinct, and in their ordinary situation; the first sound is normal, the second accentuated. The right radial pulse is fuller than the left. About three years ago, the patient had muscæ volitantes, lasting off and on for about two years, appearing only for a few seconds each time; and still at times, he cannot see things at a distance so well as he thinks he ought, the letters seeming to swim before him when reading. His left pupil is slightly dilated. Some time ago, he also had tinnitus aurium. His left cheek is often flushed, and at times he feels it warmer than the other. His lung-sounds are normal, but he has an imperfect, hard, clinking cough, without expectoration. He also frequently perspires without any apparent cause. There is a slight bulging of the walls of the chest, between the second and third ribs, at the left edge of the sternum, extending into the *manubrium sterni*, and gradually declining all around within an area covered by that of the mouth of a tumbler. Over this space, and for a corresponding distance downwards towards the heart, there is dulness on percussion, and a distinct sense of liquid pulsation. Within this region, the heart-sounds are also extremely distinct, but there is no bruit.

Twenty grains of iodide of potassium were ordered to be given three times a day, and a belladonna and opium plaster was applied over the tumour. About a month after, on the 23d of May, as the patient fancied he was not improving, the iodide was omitted, and a precisely similar dose of the bromide of potassium was substituted for it. At first, the patient fancied the change of remedy had done him good, for he had less pain, and got more sleep; but this improvement was apparently of short duration, even though the dose of the bromide was subsequently increased to thirty grains thrice a day, for on the 7th of June the iodide was again recurred to in doses of twenty grains thrice a day, with the addition of one-twelfth of a grain of iodine in each dose. On the 7th of June, it is stated that "there is more pain over the aneurism, and he feels his left hand benumbed. The swelling seems to have increased in size since the 15th inst." On the 17th of July, however, it is entered that he "states that the pain in his breast and down his arm are not nearly so bad as they used to be, so long as he is quiet in bed; but when he rises and walks about, they become even worse than before." The patient continued to wear the belladonna plaster, but on the 7th of July the iodide was omitted, probably on account of coryza, which, though not recorded, the patient has told us that he suffered from about this time; and on the 8th the following pills were prescribed :—

℞. Extr. aloës aquosi, gr. i.; extr. colchici acetic, gr. i.; mass. pil. hydrarg. subchlor., gr. ij. Misce fiat pil. mitte tales xii.; sgr. one night and morning.

There is no further record in the books of Ward III. as to the iodide being again resumed, and I am not aware whether it was or not; I believe, however, that it was. The last entry is on July 18th.—"Thinks himself easier to-day."

On the 1st of August, the patient was transferred to Ward VII., and placed under my care. He was at once placed upon thirty grain doses of the iodide of potassium three times a day, and these doses he has continued to take without intermission up to the present time (May 1868), with continually increasing benefit, and without the production at any time of the slightest unpleasant symptom. For several months, he also continued to wear a simple belladonna plaster over the tumour, but at last it blistered him, and produced so much eczematous eruption each time it was attempted to re-apply it, that it had to be discontinued. On coming under my charge, he was strictly confined to bed, and for long he lay entirely on his back, that being the only position in which he found always comparative and, latterly, perfect ease. He was only allowed to get up and move about for the first time about three weeks before his dismission on the 2d of April. He was placed upon fish diet at first,—meat being subsequently given when he tired of the fish, but he was at all times carefully warned of the necessity for strict moderation both in eating and drinking; water, small quantities of tea, and milk for supper, being the fluids supplied. With all this care, and notwithstanding the large doses of the iodide administered, his progress at first was extremely slow, but it was steady; and in a clinical lecture given on his case on the 19th of November last, I find it stated "there is no longer any tumour visible, and it is only on careful examination that you will discover any pulsation; he is so far recovered, that he is a little inclined to be rash, and to move about quickly in bed, or even to turn upon his side; but upon this the pulsation instantly returns—a sufficient warning to him that he is not yet cured." Indeed, it was not till the beginning of March, in this year, that he was able to move about freely, without discomfort or any return of the pain or pulsation. On the 1st of April, I had the honour of exhibiting this patient before this Society, just previous to his discharge from hospital, when you had the opportunity of observing the complete subsidence of the tumour described, pulsation being only to be obscurely felt in the situation where it formerly existed; you also heard the man's statement that his pain, dyspnœa and dysphagia, were gone; and you were able, from his healthy and energetic appearance, to form some idea of the importance and value of this mode of treatment. I may add, that I have repeatedly seen this patient since his discharge, and that he still continues to improve, while, from the active manner in which he marches through the streets, no one would suppose that but a year ago he was what might well be thought a hopeless invalid, afflicted with one of the most terrible and incurable of maladies. With all this improvement, however, Rice is not cured; it is doubtful indeed, whether, under his circumstances, a poor man necessitated to do something for his daily bread, he ever can be cured. But he has obtained great and incalculable relief, and his case is an encouragement to us in the treatment of similar affections, and full of hope for those who, placed in happier circumstances, may yet labour under a similar disease.

[Several other cases are related all illustrating the same thing. The following extracts from the subsequent part of the article are interesting.]

About ten years ago, a Pole presented himself to M. Nelaton, with a tumour in the lower part of the neck, which had been recognised by MM. Bouillaud, Andral, and Beau as an aneurism of the innominate implicating the aorta. He stated that while in Warsaw, his sufferings had been much relieved by the use of the iodide of potassium. M. Nelaton took the hint, and continued the remedy, the result being—to his great surprise—a notable amelioration of all the symptoms, with almost complete disappearance of the tumour, so that the Pole returned home in a satisfactory state of health.

On commencing hospital duty in August 1860, Dr. Chuckerbutty, of Calcutta, found in the wards an Irishman, aged 50, afflicted with a harrassing cough, accompanied by profuse expectoration, which remained unrelieved by any treatment until a solution of iodide of potassium, in decoction of cinchona, was employed. Coincident with the relief to the cough thus obtained, Dr. Chuckerbutty was astonished to find that an aneurism of the innominate, from which this man also suffered, became gradually solidified.

Of fifteen cases of aneurism which, so far as I know, comprise all the cases of this disease already published, in which the treatment by iodide of potassium has been persistently carried out, there has been in all save one—and that a perfectly hopeless case—a marked relief to the suffering; in twelve there has been undoubted diminution in the size of the sac, while in a few, the number of which a longer continuance of the treatment has ere now probably increased, there has been so complete a subsidence of the tumour and relief of all the symptoms as to amount to an apparently perfect cure. These results are extremely encouraging; and when we reflect upon the entire absence of any risk to the patient from the treatment, and the almost absolute certainty of relief to his sufferings being at least attained, I think we are warranted in saying that no treatment for aneurism, and especially for internal aneurism, hitherto devised holds out anything like an equal prospect of relief, if not of cure, with that by the iodide of potassium.

To attain these objects fully, several circumstances must be carefully attended to, and the first of these is the dose of the remedy to be administered. In the cases related, the dose has varied from five grains to thirty, three times a day. In one case, ten grains thrice a day produced violent salivation, which ceased on a reduction of the dose to five grains; in another, twenty grains thrice a day seemed to produce violent diarrhœa, which also ceased on a reduction of the dose to five grains. In one of my own cases, considerable coryza was produced at first, while the patient was taking only twenty grains thrice a day; but this rapidly ceased upon intermitting the remedy, and did not subsequently recur, though the dose was afterwards increased to thirty grains thrice a day, and continued many months. In my other two cases, thirty grains twice a day were administered, without any ill effects from the first; in one of them, however, pain in the stomach or head occasionally supervened, but was at once relieved by intermitting the remedy for a few days. Now, whether the action of this remedy consists in altering chemically the constituents of the blood, or in influencing in some unknown manner the vitality of the blood, or of the organs in which it circulates, it seems probable that it is in some measure proportionate to the quantity ingested, because the relief of pain, which is one of the earliest symptoms of amendment, is not produced till a certain efficient dose has been given. It seems therefore of consequence to attain that efficient dose as rapidly as possible, and whether it be that a large dose more readily establishes a tolerance of this remedy or not, there is certainly no evidence as yet before us to prove that this drug can be more safely administered by beginning with small doses, and gradually increasing them, than by commencing with full doses, as of thirty grains at once, intermitting them occasionally for a day or two on the occurrence of any symptoms which seem to call for this. In attempting to produce the specific action of iodide of potassium, saturation of the blood seems to be imperatively required by the rapidity with which the secreting organs, and especially the kidneys, remove it from the system—twenty-four to seventy-two hours' abstinence from the drug having always sufficed to cause the disappearance of every trace of its presence from the urine. While the continuous administration of large doses may possibly in time succeed in saturating not only the blood, but even the tissues, at all events some such effect seemed to have been produced in Case 1, in whom, in the latter months of his treatment, the application of a belladonna plaster was always followed by vesication and an eczematous eruption, although he had previously worn such plasters for many months without any ill effects, and it was only after this thorough saturation was attained that this patient's improvement progressed with any rapidity. From the apparent importance of this element of saturation, and the safety with which it can be produced in most cases, its attainment being evidently not necessarily connected with the development of any unpleasant symptoms, which occasionally then cease to appear, though they have been present at an earlier stage of the treatment, the proper procedure in all cases in which unpleasant symptoms arise, would seem to be not diminution of the dose, but temporary intermission of the drug, and possibly, in some instances, its combination with some counteracting agent, such as opium. And I make this suggestion the more readily because, though large doses of this drug have unquestionably a greater tendency to irritate the gastro-intestinal mucous membrane—an irritation which may be checked by intermitting the drug, or altering its mode of administration—other unpleasant symptoms, such as coryza, etc., do not seem to be necessarily connected with largeness of the dose, but seem referrible more to idiosyncracy than to poisonous action. The only severe case of coryza which I have seen produced in this manner has been apparently due to the trifling amount of the iodide contained as an impurity in a few drachms of the bromide of potassium—the bromide itself, I believe, producing no such effect.

As to the length of time during which this treatment ought to be continued, we have as yet no means of judging. Many of the cases I have quoted seem to point to a few weeks as sufficient to establish a curative result, but this has not been my experience. A certain amount of relief may no doubt be rapidly attained, but any considerable amendment has only been procured after keeping the patient for many months persistently saturated with the drug; and I should not consider that this treatment had a fair trial, unless it had been carefully carried out for at least twelve months, while it is probable that the full benefit is not to be derived, in many cases at least, except by a steady persistence in its use for several years. But this treatment is of too recent introduction to say anything positive on this head.

In regard to the adjuvant treatment, there are one or two remarks to make which seem to me of considerable importance, and these may be comprised under the two heads of position and diet. Whatever is capable of lessening the frequency of the heart's action, without impairing the strength of the patient, or vitiating the quality of his blood, cannot be an unimportant adjuvant in the treatment of aneurism. The enforcement of the recumbent position, therefore, which is so influential in this respect, has seemed to me a matter of paramount necessity, and has been strictly carried out in all my three cases; indeed, in the most serious one (Case 1), the patient was laid upon his back for fully seven of the eight months he was in my ward, not being permitted even to turn upon his side—any attempt to do so being always attended by a recurrence to some extent of the pain, along with an uncomfortable sensation of pulsation. I have no doubt that the success attained in his case is very considerably due to the long-continued perfect rest in the recumbent position; and in the treatment of so serious a disease as internal aneurism, I should consider it most unwise to neglect the employment of this simple but efficient mode of aiding the cure. No doubt the enforcement of this portion of the treatment is irksome and impossible of attainment without the intelligent acquiescence of the patient, but I have not had any difficulty in obtaining this, on explaining my reasons, and the object I had in view; and I may make the same remark as to diet. Aware of the evils of starvation on the one hand, and of plethora on the other, my patients were put upon a somewhat restricted mixed diet—fish being given for dinner, at first at all events, as being the least nutritious form of animal food, while they were told voluntarily to restrain their appetite as much as possible, and to make use of no more than what they felt to be sufficient to maintain themselves. In regard to fluids, water, tea, or milk alone were allowed; and though they were not doled out in a measured quantity, yet similar directions were given in regard to them as in regard to solid food; explanations were given in regard to the result desired, and the evils to be avoided, and careful inquiries were daily made as to the mode in which these advices were being complied with, so as to impress their necessity and importance upon the patients. I have had no reason to be dissatisfied with the result of this reciprocal confidence between patient and physician, and I believe it to be more conducive to the wellbeing and the comfort of the former, than any more precise definition of amounts by weights and measures. The principles of the treatment were intelligibly laid down, and intelligently acted upon, and the effects daily noted, and the result has been that all of my patients have, without becoming plethoric, yet preserved a healthy and well-nourished appearance throughout the whole of their tedious treatment.

In regard to the mode of action of the iodide of potassium, I have already mentioned that Dr. Chuckerbutty supposes it to increase the coagulability of the blood, and that Dr. Roberts seems to consider this a probable theory. The correctness of this idea is, however, doubtful; it might explain the coagulation of the blood in the aneurismal sac, but it could not explain the great relief to the pain, which is the almost immediate result of the ingestion of an efficient dose. Moreover, large doses of iodide of potassium relieve the pain of many cases of rheumatism, and the distressing spasm of asthma; in the latter disease, indeed, far larger doses have been given than that I have recommended—Dr. Aubrée having successfully treated several cases with doses of forty-five grains three times a day; these are diseases in which increased coagulability of the blood is not likely to be beneficial, yet the relief to suffering in all these cases is very marked, and, at all events, as regards rheumatism and aneurism, very similar in character. So far as I know, no one has hitherto attributed to the iodide of potassium sedative properties similar to those known to be possessed by the bromide ; yet it is possible that it may act as a sedative to the nervous system, modifying its action in some unknown manner, and it is probable that its curative action in all these cases is due to this peculiar modification of nervous action—the coagulation of the blood in the aneurismal sac being the result of secondary causes. In Case 2, this treatment produced an immediate and remarkable effect in lessening the fulness and force of the pulsations, not only in the tumour, but throughout the whole arterial system, and this not to our observation alone, but also as perceived by the man himself. This sedative action, which must have been exerted primarily on the nervous system, must no doubt favour greatly the coagulation of blood in an aneurismal sac ; though not observed, it may have existed in the other cases, and it gives the only rational explanation of the peculiar effects of the iodide according to our present knowledge. I regret that in none of my cases was the sphygmograph employed to record the force of the arterial pulsations ; and thus to detect any deviations produced by treatment ; in any subsequent cases that may come under my care, I shall endeavour to do this so as to settle this matter.

I need hardly say that, notwithstanding the great and manifest relief obtained in almost all cases of aneurism by this treatment, positive cures can only be exceptional, of comparatively rare occurrence, and the result of long-continued and careful treatment. An aneurism may prove fatal in so many various ways besides rupture, that the mere coagulation of the blood within the sac is a comparatively small step towards a complete cure, though by no means an unimportant one. The relief obtained can only be regarded as unequivocally tending towards a cure, when, from the symptoms, it is apparent that the aneurism is not only becoming more solid, but also shrinking in all its dimensions ; and even then incautious exertion may rupture the sac at some point where fluid blood may still communicate with the arterial canal, and death may thus ensue while the patient is flattering himself that he is being cured. Compression of important organs by the solidified sac may also induce dangerous and even fatal complications. And even under the most favourable circumstances, the occurrence of aneurism of a large and important artery proves the existence of such a diseased condition of the arterial coats as will render the patient's life ever after a precarious one.

Notwithstanding the great relief to the symptoms in almost every case, it is obvious that anything beyond this—anything at all approaching to a cure—can only be expected in sacculated aneurisms, and chiefly in comparatively young individuals, and in cases more or less of a traumatic character, that is, produced by unusual exertion, as evincing a possibly less seriously diseased condition of the arterial coats than where the aneurism has occurred more gradually, and, as it were, spontaneously. On the other hand, when the aneurism has been of slow and spontaneous growth, these very circumstances, evincing as they do the existence of a greatly diseased condition of the arterial coats, would form unfavourable elements in estimating the probability or completeness of a cure ; and the presence of more than one aneurism in the same person would seem likely to reduce still further the chances of anything beyond mere temporary improvement ; but as the history of Case 3 shows, even in such cases this improvement may be so great as to be well worth all the trouble expended in attaining it.—*Edinburgh Medical Journal, July* 1868, *p.* 33.

53.—POPLITEAL ANEURISM: CURE BY PRESSURE IN TWENTY-EIGHT HOURS.

Case under the care of Sir HENRY THOMPSON, at University College Hospital.

[The patient was a labourer 59 years of age, and his symptoms had existed about seven weeks prior to admission.]

On admission there was an oval tumour, about the size of a small orange, in the popliteal space, painless, smooth, non-adherent to the skin, and distinctly circumscribed. It was situated immediately over the aspect of flexion, and extended rather more beelow than above the head of the tibia. There was a distensible eccentric impulse synchronous with the heart's systole, ceasing when the femoral was compressed, and refilling again with a bound when the pressure was removed. Pulsation was perceptible in the anterior peroneal artery. In the anterior, but not posterior, tibial artery, a blowing, but not very loud murmur, was audible on auscultation. The cutaneous veins were enlarged over the tumour. The circumference of the affected limb was five-eighths of an inch in excess of its fellow.

As the tumour was small, it was thought expedient first to adopt the treatment by flexion. Accordingly, on the following day, the limb was bandaged, gently flexed upon the thigh, and retained in that position by additional bandages. The flexion caused no pain. The limb was kept in this position four days, until two p.m. on the 21st, by which time no difference in the pulsation was perceptible. Mr. Ernest Hart saw the case, and flexed it more completely. The limb, however, was set free on the 23rd, as the knee had become swollen and painful. On the

the following morning, at 11 o'clock, the leg having been previously bandaged with stocking elastic, a Carte's compressor was applied over the femoral artery just opposite Poupart's ligament, and another was applied about four or five inches lower down. The patient himself, a very intellent man, changed the compressor about every three-quarters of an hour, and felt little discomfort from its application. *By half-past three on the following day, twenty-eight hours after the first application of the compressor, all pulsation in the tumour had ceased.*

The patient from this time had no bad symptoms; he slept and took his food well. The compressors, which had been kept on at half pressure since the pulsation ceased, were loosened altogether on the 28th, although not taken off the limb; and the bandages partly undone. He was able gradually to straighten his leg. The tumour gradually diminished, and left merely a small hard tumour. He got up for the first time on May 9th, but was unable to put his foot to the ground; and slight œdema resulted on the following day, which, however, gradually diminished. He was speedily able to walk, at first with the assistance of crutches; and left the hospital on the 8th, perfectly well.—*British Medical Journal, July* 4, 1868, *p.* 7.

ALIMENTARY CANAL.

54.—A CASE OF STRICTURE OF THE ŒSOPHAGUS AFTER SWALLOWING CAUSTIC POTASH.

By Jonathan Hutchinson, Esq.

[Mrs. O.— swallowed by accident some caustic potash, and although she recovered easily from the first effects, the symptoms of a contracting stricture of the œsophagus were steadily developed. She was attended by Mr. Mead, of South Hackney, with whom Mr. Hutchinson saw the case for the first time on September 6th, 1866.]

On the next day Mr. Mead, Mr. Ross, and I met, and having put Mrs. O. fully under the influence of chloroform, in the sitting posture, I made a long trial of bougies of various sizes. I could pass the upper stricture easily with the largest, but I could not get even a No. 8 catheter through the lower one. The catheter (an ordinary urethral one) came against the stricture when it was passed its whole length, so that the handle was level with her teeth. I could not even get the end of the catheter into the stricture, so as to find it gripped.

The failure of this trial, made with every advantage, was very discouraging. As the testimony of herself, her husband, her son, and her surgeon was unanimous, and to the effect that she was rapidly losing ground, as she had almost literally swallowed nothing for a week, I came to the decision that it was not a case in which delay was proper, and advised that an opening into the stomach should at once be made. In arriving at this conclusion, I was much influenced by the knowledge that in these cases the stage of fatal collapse sometimes comes on suddenly, and that all who have performed the operation have left the caution to their successors, not to delay the measure until the patient has become too ill to have a chance of surviving it. Our patient seemed to be a most suitable subject for it. She was very thin, and the stomach was tympanitic, and would probably be easily found. She was very anxious for relief, and had remarkably good control over her feelings. Having fully explained to her husband the kind of advantage to be hoped from the operation, and the risks which attended it, he eagerly urged us to do what we thought the best. Arrangements were accordingly made for the performance of the operation at 3 o'clock the next day. I intended not to give chloroform, to introduce a large *silver* tube into the wound and retain it, closing the surrounding parts very carefully, and in the after-treatment to keep ice bladders on the abdomen. For the first few days I proposed still to continue feeding by the rectum, and if practicable, to avoid disturbing the stomach by introducing food prematurely into its cavity.

On the following day, however, our patient was so much better that it was decided to defer the operation. She had swallowed a little milk and beef tea very soon after our trial of the bougie.

During the next week Mrs. O. continued to improve in capacity for swallowing, and took daily fair quantities of fluid. She gained strength, slept fairly, and was in good spirits

We did not use the bougie again for ten days, when, as she had more difficulty, another attempt was made. I had had a *conical* bougie constructed, hollow through its upper two-thirds, so as to permit of the introduction of a steel stillette, thus allowing the end to remain flexible, and enabling me to stiffen and give force to the stem. In practice, however, I found the bougie long enough and stiff enough. Introducing my fingers well into the mouth, so as to press straight downwards, I was able to get the end of the bougie (a No. 6 urethral) well into the stricture, but not through it. During the week following she took food fairly, and on September 28 she was decidedly in improved condition.

After this date it was not necessary for me to see her. She remained under Mr. Mead's care, and, without any further use of bougies, steadily advanced. Her husband frequently called on me to report, and his statement always was that she took fluid nutriment better and better.

At the present time (a year later) Mrs. O. is in better health than she has been for years. She still suffers from stricture, and can only swallow solids when carefully minced. She is more than a stone lighter than she formerly was, but has wholly lost certain dyspeptic and nervous symptoms, which, before her accident, used to trouble her much. She is able to go about all her usual duties. Should the stricture ever show tendency to contract she is prepared to submit to bougie treatment, but for the present is content with her condition.

I trust it has been made clear to the reader that Mrs. O. had a very narrow escape of a very dangerous operation. Yet, notwithstanding the satisfaction which I feel in the fact that we did not perform it, I must contend that its recommendation was fully warranted by the prevailing rules of surgery. If ever there was a case for gastrotomy, this was one. The stricture was not malignant; if, therefore, the patient survived the operation, she might be expected to enjoy an indefinite prolongation of life. The bougie had been carefully tried by several hands and had failed. She was getting daily weaker. I had employed chloroform, and made a very prolonged attempt to get the bougie through the stricture without success.

The case has made such an impression on my own mind, that I cannot conceive any circumstances which could in the future induce me to abandon the bougie and resort to gastrotomy. It is clear that these cases are never hopeless, and that it is quite possible that just when the last stage appears imminent, a change for the better may ensue It is clear also, that a tight cicatricial stricture, once dilated a little, may remain for long after without giving further annoyance. My remark as to the unjustifiability of operative interference refers especially to cicatricial strictures. In these the one object is to preserve life, whilst in some others, there may be also the secondary one of mitigating suffering, and this, too, even to some extent regardless of the result to life.

Let the advocates of opening the stomach produce one case with results after the operation as good as those which I have recorded above. Against that one case, when it is produced, I shall ask leave to set the numbers who have died directly in consequence of such operations, and still further to suggest that, even in that one, the result might very possibly have been as good without it. The dilemma in which the advocates of gastrotomy are placed is this—the operation is confessedly so dangerous, that it is not justifiable till the case is otherwise hopeless, whilst facts prove that it is not possible to make such a prognosis without risk of error. It appears to me that there are several other surgical procedures which stand with it in a similar position :—Opening the abdominal cavity to search for a cause of intestinal obstruction ; trephining the vertebræ for fracture of the spine ; ligature of the innominate or inner third of subclavian artery ; the distal ligature of large vessels ; and some others, are such dangerous methods of treatment, that they cannot be resorted to excepting in the supposed inefficiency of all other means. Yet the cases for which they are proposed are never actually hopeless, and every now and then, in those apparently most so, recovery will ensue. We have, for instance, in the London Hospital Museum, a splendid specimen of cured aneurism of the innominate, the cure having been by a modified Valsalva's method, without operation. Let the advocates of distal ligature show such another. Respecting all the operations I have mentioned, I may express my firm conviction that the surgeon who resolutely declines to perform them will in the long run do more for the lengthening of his patients' lives than he who, although with the utmost acumen of diagnosis and skill in operating, permits himself to resort to them. There are other means of treatment, less brilliant but more hopeful.—*Clinical Lectures and Reports of the London Hospital*, 1867-8, *p.* 56.

55.—THE RADICAL CURE OF HERNIA.

By Dr. J. Fayrer, F.R.S.E.

[Dr. Fayrer, states that his plan of treating hernia radically is a modification of Professor Syme's method, and is valuable on account of its simplicity. The instruments required are a plug of wood, with two ligatures, a curved needle to pass the ligatures through the abdominal wall, and a second small piece of wood to knot the ligatures over.]

The method of performing the operation is simple, but it requires some care and confidence for its effective completion. The fore-finger of the left hand oiled, is inserted into the inguinal canal, and the scrotum invaginated is pushed before it up to the internal ring with firm and decided pressure. One ligature, strong and well waxed, is then threaded in the needle, the point of which is insinuated along the palmar aspect of the finger on its radial side, until it has reached the extreme apex of the invagination ; it is then forced through the abdominal parietes, and appears on a line with the anterior superior spine of the ilium ; about 1½ or 2 inches internal to. The needle is then unthreaded and withdrawn, to be threaded with the second ligature, and again introduced, this time on the other side of the finger, to be pushed through the abdominal wall as before ; this time transfixing a short distance from the point where it first pierced, but emerging through the same opening in the integument.

The needle is again unthreaded and withdrawn. The plug is now pulled into the canal, the apex being firmly tied against the apex of the invagination, and the threads firmly knotted over the small piece of wood. The operation is thus completed.

The plug is left *in situ* for three or four days or more, until pus appears to flow freely from beside the ligatures. These are then cut, and the plug withdrawn. The discharge is gently pressed out, a pad and spica bandage are applied, and the patient is kept in bed and cautioned not to strain at stool for some days. As soon as the wounds have cicatrised, a truss may be applied, which should be worn for some months, especially when any exertion is made; it may gradually be left off when the tissues have become firmly consolidated. The time occupied in treatment varies from a month to six weeks in ordinary cases; if there be much suppuration, and that have burrowed among the abdominal muscles, there may be delay, and counter-openings may be necessary; but such cases are the exception. The only one was that of a native who was attacked with erysipelas and died of pyæmia, the result of cellulitis. During the period of the insertion of the plug, the bowels generally remain confined, and indeed for several days after its removal; should they act, the patient must be warned against efforts at straining.

I find, by referring to the records of my wards, that I have, up to the end of 1867, operated sixty-seven times. In 1862, I had fifteen cases, and of which ten succeeded, one was relieved and four failed. In 1863, there were eight cases, of which five were successful, two only relieved, and one failed. In 1864, I had eight cases, of which six were successful, two relieved. In 1865, I operated in fourteen cases, of which ten were successful, three relieved, one failed. In 1866, there were seven cases, five successful, two failed. In 1867, I had fifteen cases, of which ten were successful, one was relieved, three failed, and one died.

Ram Coomas Doss was admitted on the 27th February, 1867, with inguinal hernia of left side; he was operated on 5th March, 1867, and died of erysipelas, on the 26th of March, 1867. Extensive suppuration was set up between the muscles. Erysipelas took place in the chest, the cellular tissue sloughed, and free incisions were made to expose the sloughy tissues. After death, there was found consolidation of the two lower lobes of the right lung, and one large pyæmic patch of the upper lobe. There was no cardiac coagula. There was thus a total of sixty-seven cases, of which forty-six were apparently successful; nine were relieved; eleven failed altogether, and one died.

Before discharging any of those returned as cured, they were submitted to the severest tests, lifting weights, climbing up a pole, jumping, running up and down stairs without a truss; and unless they were able to bear this test, they were not considered as cured. In many of these I fear the hernia may have returned afterwards. But I have seen some after a long interval, and am happy to say there can be no doubt that in these cases the improvement is permanent.

I have placed on the table a specimen illustrative of the mode in which the occlusion is effected; it was the case of a French sailor, who had been operated on some months before he met with an accident, which caused his death. You will see that the internal ring is perfectly closed. I have also brought into the room several patients who are recovering from the operation, and so far they promise to do well. I have also some persons who were operated on at different periods of time past, and you will be able to judge by them how far we may, in favourable cases, hope to succeed. I would here repeat what I have often before stated, that I regard the operation as one of a somewhat uncertain character as to its results, but offering a sufficient prospect of success to warrant the surgeon, and justify the patient, in attempting it.—*Brit. Med. Journal, Aug.* 8, 1868, *p.* 136.

56.—ON LUMBAR COLOTOMY FOR THE RELIEF OF INTRACTABLE DISEASES OF THE RECTUM.

By T. B. Curling, Esq., F.R.S.

[Four cases are related in this paper, of which we give the substance of the first, and the second in full. In the first, which was cancer of the rectum, the operation is thus described :]

Mr. Curling made a transverse incision between four and five inches in length ; the incision was then carefully deepened, the muscular substance cut through, a little fat dissected away, and the colon bulged into the wound. A large nerve came into view, but was pushed aside ; there was at first a little arterial bleeding, but the vessel could not be found, and on deepening the incision the hemorrhage ceased. The colon having been exposed, two thick ligatures, having a needle at each extremity, were passed through it, one near each end of the wound. The gut was next opened with scissors, and attached to the edges of the wound by means of the ligatures previously passed through. The lateral end of the wound was closed by two wire sutures, and the patient removed to the ward. A piece of spongio piline was ordered to be laid over the wound, and kept wet with the following lotion, Tr. iodinii ʒiv. aquæ ℥viij. The patient to have a draught of warm brandy-and-water, and afterwards tr. opi ♏xl.

[Great relief was obtained, but of course the original disease progressed to a fatal termination.]

This case shows the benefit which may be gained by lumbar colotomy in relieving the sufferings attending cancer of the rectum. An artificial anus appears very repugnant to persons in health, but the distress which arises from frequent painful scalding motions, and from incontinency, is so great that it is not surprising that patients are willing enough to submit to this operation in order to get relief, even without any prospect of ultimate cure. There can be little donbt, however, that life was prolonged in the case just related, by the removal of one great source of exhaustion.

In my work on *Diseases of the Rectum* (3rd edit. p. 145), I have remarked that we sometimes meet, especially in hospital practice, with old, inveterate, and neglected strictures, in which the disease is too far advanced to offer any prospect of being benefited by dilatation. And, in spite of all our care and palliative remedies, the disease will continue to make progress, wearing out the patient's strength, and ultimately proving fatal. My experience in the performance of lumbar colotomy having impressed me with its freedom from any unusual risk, I resolved, when a case of stricture of the rectum, such as I have just described, came again under my care, to suggest this operation to the patient, in order to obviate the misery attending the disease, and to prolong life in a state of comparative comfort. This was done in the following case.

Case 2. Intractable stricture of the rectum successfully relieved by establishing an anus in the left loin.—M. A., aged 26, a farm labourer from Essex, was admitted into the London Hospital, December 3rd, 1865, on account of disease of the rectum. He was sallow and had an emaciated cachectic appearance; he had suffered from disease of the rectum for more than twelve months, and complained of great difficulty and pain in defæcation with straining. He was also troubled with a constant watery discharge, more or less tinged with blood. He had been many weeks in St. Bartholomew's Hospital, where he had undergone some operations. On the 8th I examined the bowel and detected a close stricture about two inches from the anus. It was so tight and firm that I could introduce only the point of my finger into it. The bowel below the stricture was thickly studded with vegetations, and there were some flaps of integument round the anus. The examination caused great pain. I placed him upon a nourishing diet with wine, and directed a No. 7 elastic gum bougie to be passed on alternate days. This was done by Mr. Colquhoun, the dresser. In a few days the size of the bougie was increased to No. 8, and on the 20th to No. 9. During this treatment he suffered from diarrhœa, which was checked by astringent mixtures. The watery discharge from the rectum also continued very profuse. The passage of the bougie caused considerable pain, and was discontinued. His health was falling off.

Feb. 2. I ordered a solution of nitrate of silver (gr. x ℥j) to be applied with a camel's hair brush to the stricture and bowel below it. As the stricture did not yield to treatment, the pain and irritability of the bowel increasing, and he was gradually getting weaker and worn out by the disease, I suggested to him on the 8th to undergo lumbar colotomy, and explained the nature and object of the operation. In a week afterwards, having consulted his friends and being satisfied that he was getting worse, he consented to the operation, which was performed on the 14th in the usual way; the colon being previously well distended with linseed tea injected through a long tube passed beyond the stricture. He recovered favourably from the operation. The fæces escaped freely from the artificial anus, but there was a free discharge of a slimy mucous fluid per anum. This was checked by injections of tannic acid into the rectum below the stricture. About a month after the operation he passed some liquid feculent matter by the natural passage for two or three days, but afterwards all evacuations took place from the loin. Subsequently rather strong injections of chloride of zinc were substituted for the tannic acid, and used two or three times a week with the view of reducing the vegetations in the bowel. With what effect I could not ascertain as the patient, finding digital examinations painful, persistently refused to allow me to make one. The discharge, however, diminished a good deal. He improved in health rather slowly; became exceedingly timid about any surgical interference, and left the hospital of his own accord at the end of May.

I saw nothing more of the man until February 22nd, 1867, when he visited the hospital; he was looking pale, weak, and out of condition, and stated that he was doing no work, not feeling equal to it. He was on parish allowance; he suffered no pain in the rectum, and no evacuations occurred by the natural passage, but there was a slight discharge occasionally from the rectum; he refused to allow me to examine it. There was a considerable prolapsus of the bowel at the artificial anus. It was easily reducible, and subsided spontaneously when he was recumbent. He wore a belt, but it was not fitted with a proper pad to restrain the prolapsus; his bowels acted once and sometimes twice a day.

Though the operation in this case fully answered the end in view, in relieving the patient of the pain and other troubles resulting from the stricture in the rectum, his constitutional improvement was not so great afterwards as I had hoped for, which, no doubt, was greatly due to his having a naturally unhealthy constitution, as well as to his indigent circumstances, which made it difficult for him to procure a sufficiency of good nutritious food.—*Clinical Lectures and Reports of the London Hospital*, 1867-8, *p.* 1.

57.—TREATMENT OF HEMORRHOIDAL AFFECTIONS.

By JOHN WIBLIN, Esq., Southampton, and HENRY SMITH, Esq.

[Mr. Wiblin states that he has operated upon thirty-three cases of hemorrhoidal tumours by means of Mr. Smith's clamps. Some of these cases were of a formidable character, and all obtained the most complete success.]

In one case, that of a Colonel B., who, on his return from India, broken down in health, anæmic, emaciated to an extent I have never before witnessed from repeated loss of blood, I found a large pendulous hemorrhoidal excrescence, very much resembling in shape a moderate-sized bunch of grapes, with a large exposed surface of intestinal mucous membrane. Having placed the patient under the influence of chloroform I removed the whole of the mass, and four tolerably large portions of mucous membrane, by means of three clamps, without the loss of more than an ounce of blood. The patient was confined to bed for five days only, never having experienced a single symptom calculated to interfere with his rapid recovery. At the expiration of the time I have mentioned the gentleman was able to take carriage exercise; he made a rapid convalescence, and he is now in the enjoyment of perfect health.

The clamp modified and perfected by Mr. H. Smith is admirably adapted for the purposes for which it is advocated, and I feel persuaded that any surgeon who will take the trouble to employ the clamp method of removing piles will find that it possesses great advantages over the barbarous practice of the ligature operation. The result of my experience testifies to the total absence of secondary complications in the former, and to very frequent retention of urine and a return of the disease after operative procedure in the latter.

The toy-like ivory appendage to Mr. H. Smith's instrument I regard as unnecessary, and only calculated to increase the already extravagant charges of the instrument maker.

[Mr. SMITH, after expressing his pleasure at Mr. Wiblin's favourable report of the utility of the clamp in the treatment of hemorrhoids, observes :]

I must take exception to Dr. Wiblin's remark at the end of his letter. He says:—"The toy-like ivory appendage to Mr. H. Smith's instrument I regard as unnecessary, and only calculated to increase the already extravagant charges of the instrument maker."

Now, with regard to this point, perhaps you will permit me to state that, next to the securing of perfect parallelism of the blades of the clamp, I regard this "toy-like appendage" as the most important part of the instrument; and I can speak of it more freely as the suggestion to line the outside of the blades was due, not to myself, but to Dr. Vine, of Covent Garden, who assisted me in nearly all my earlier operations, and who always took a great deal of interest in the perfecting of the clamp. This ivory sheathing acts as a non-conductor of heat, and thus the heated iron may be applied very freely without the production of pain or damage to the parts upon which the clamp rests. Of course, if chloroform is used the metallic blades alone may be employed; but I should say that in more than fifty per cent. of my cases I do not give chloroform, and then it is we see the value of the "toy-like ivory appendage."

I have been anxious to give this explanation of the reason why I use the ivory sheathed clamp, because next to that almost absolute safety attending this treatment, as much freedom from pain as is possible to the patient should be sought for, and that object will be best attained by using a clamp possessing the "toy-like appendage" which my worthy friend thinks "unnecessary," but which I am sure he will always for the future use, after this explanation.—*Lancet, Sept.* 19 *and* 26, 1868, *pp.* 396, 426.

58.—CASES ILLUSTRATING THE TREATMENT OF HEMORRHOIDS AND PROLAPSUS OF THE RECTUM.

Under the care of Henry Smith, Esq., at King's College Hospital.

Those who have been in the habit of attending the practice and operations at King's College Hospital, are familiar with the method which is adopted by Mr. Henry Smith for the treatment of hemorrhoids and prolapsus of the rectum. This process, together with a description of the instrument used, was first made known to the profession in the Lancet of Oct. 4th, 1863. (See *Retrospect*, July to Dec. 1863, p. 117, and also July to Dec. 1862, p. 100. This article contains a woodcut of the instrument). It consists in the use of what is termed the "hemorrhoidal clamp," by means of which the tumours are seized and compressed. They are then successively cut off by scissors, and the divided bases of the tumours are thoroughly cauterised by the hot iron. At an earlier period nitric acid was used for the purpose of arresting the bleeding, but on one occasion some serious loss of blood occurred, and Mr. Smith has since trusted entirely to the actual cautery, which, if properly applied, thoroughly arrests any bleeding.

Mr. Smith has now used this method of treatment very extensively in the most severe forms of hemorrhoids and prolapsus of the rectum, and the success attending it has been such as to cause its adoption to a great extent both in this country and the colonies. Of the numerous cases which have occurred in the hospital, there has not been a single instance where any bad result whatever has taken place, and only one instance in which the treatment has failed to cure the disease. The merit of the plan consists in its being free from danger, and in insuring for the patient a very short convalescence as compared with that following the use of the ligature. In by far the majority of the cases the patients have left the hospital on the fifth day, or within a week; and in several instances Mr. Smith has performed the operation in the out-patient room, but, except in some cases, he does not recommend this, as perfect rest after the operation is very desirable. When mucous membrane alone has to be removed, the pain is so slight that Mr. Smith never administers chloroform; but when, as is often the case, there is a considerable amount of skin to be removed, he employs anæsthesia. The absence of anything like severe pain on the use of the cautery is accounted for by the fact that the clamp is lined on the back of the blades with ivory, so that the heat is not transmitted through the metal to the surrounding parts.

We will insert a few cases, to illustrate this mode of treatment, from Mr. Smith's case-book.

Case 1.—M. C., aged 48, suffered from bleeding piles for fourteen years; the hemorrhage has continued for three days at a time, and has latterly burst out after walking any distance. On examination, a mass of bright vascular hemorrhoidal tumours was found protruding from the anus. On the day after admission (July 20th), the bowels having been well cleared by castor oil, the tumours were successively seized by the hooked forceps, embraced by the clamp, and then cut off; the actual cautery was applied to the base of each, bleeding being completely arrested. No bad symptom followed the operation. The bowels were kept locked up by the opium until the 23rd, when they were acted upon by castor oil. She was discharged on the 26th.

Case 2.—J. C., aged 61, terribly blanched by hemorrhage from the rectum, was admitted into the hospital July 19th, with a large prolapse of the entire circumference of the mucous membrane of the gut. The operation was performed July 20th.

The clamp was applied to as many as five segments of mucous membrane. Cautery also was used. The hemorrhage was completely controlled. No bad symptom followed. The bowels were acted upon by castor oil on the 23rd; and the patient, although much reduced by the previous hemorrhage, was able to go out of the hospital exactly a week after the operation.

Case 3.—J. C., aged 40, admitted into the hospital on April 17th. On examination, four large internal hemorrhoids, of a bright vascular character, protruded at the anus. The operation was performed on the 18th, four tumours being removed. Cautery completely checked the bleeding. No bad symptom followed and the patient was discharged from the hospital on the 22nd.

In the following case there is presented an instance of one of the worst forms of prolapsus, and one but rarely seen. It was the case we have alluded to, where the operation by the clamp failed to produce a cure. Mr. Smith was of opinion that he did not remove enough of this prolapsed membrane. And it is probable that the removal of a greater amount of skin at the first operation would have been more useful. The effect of the treatment by a combination of the nitric acid with very free excision of the relaxed skin is well illustrated here. If this treatment had not succeeded Mr. Smith's intention was to use the clamp again much more freely than he did at first.

Case 4.—Mrs. W., aged 50, was admitted in the early part of July, under the care of Mr. Henry Smith. She had an enormous prolapse of the rectum, consisting apparently of the entire coats of the bowel. The mucous membrane was smooth and vascular, and scarcely at all altered in its texture The tumour was nearly the size of an infant's head, the surrounding skin was loose and thick, and the anus was so dilated that the entire hand could be introduced. The affection had been the source of the greatest misery to the woman for many years; and, in 1866, she had been under the care of Mr. Smith, who had operated with the clamp, removing some superficial portions of mucous membrane, and excising some slips of skin from around the anus. But the relief was only partial, and it was Mr. Smith's intention to perform a second operation; but the patient remained away until the present time, when she returned with her disease quite as bad as before. As the mucous membrane was so entirely unchanged, and as the prolapsus seemed to depend greatly upon a laxity and weakness of the anal orifice, Mr. Smith determined to try the effect of nitric acid to the mucous membrane, and a free removal of the skin around the anus.

On July 11th, chloroform being given, strong nitric acid was applied to the entire surface of the prolapsed bowel with the utmost freedom. The skin from around the anus was next removed in long and deep slips at right angles to the orifice.

The bowels were kept locked up for four days, when they were acted upon by castor oil without the least prolapse. The wounds slowly healed, and produced a firm cicatrix. The patient was kept in the hospital for a month without the least appearance of prolapse, and it is to be hoped that the cure will be permanent.—*Lancet, Sept.* 5, 1868, *p.* 311.

59.—ON THE TREATMENT OF HEMORRHOIDS.

By Dr. J. Mulvany, Assistant-Surgeon Royal Navy.

Few diseases occasion more distressing sensations than internal hemorrhoids; few are productive of more corporal debility, or mental disquietude—irksome to the patient, hitherto contumaceous to the physician, they have long afforded an arena for the exercise of surgical skill: the number of remedial agents which from time to time have been recommended for their removal, affording at the same time ample evidence of the fecundity of the inventive genius of the faculty, and the intractability of the affection. Blisters, the actual cautery, persulphas, and perchloras ferri, the knife, the ligature, separately and conjointly, have been warmly extolled. Latterly, to the application of nitric acid, first, I believe, used in Dublin, is unanimously conceded the largest meed of laudation. But however efficacious such an application may be, the nervous, debilitated, chronic sufferers, who form the majority of those seeking surgical aid in those cases, will not submit without repugnance to the employment of so potent an agent. A simplification of the mode of treatment, sans the knife, nitric acid, *et hoc genus omne*, occurred to me, might be suggested by a careful consideration of the anatomy during health, and the pathological condition during varix of that portion of the alimentary canal, which may be termed the hemorrhoidal region, extending from the anus to a line or two above the internal sphincter. Superiorly, this is lined by mucous membrane, by no means intimately adherent to the subjacent tissue; inferiorly its character changes, and becomes muco-cutaneous; whilst, in the middle third, we find the cutaneous element prolonged into triangular vertical linguettæ, named by Morgagni, the columns of the anus. At their junction, *en bas*, they form a number of valvular folds more or less elevated, with their concavities directed upwards, which are deserving of attention. Next to the mucous membrane is the cellular coat in which the hemorrhoidal vessels ramify; more externally are the sphincters, next a few pale muscular fibres, prolonged from the longitudinal bands, imagined by Sappey to assist in dilating the anus, and which probably serve by their contraction to assist the movement of the venous blood through the superior hemorrhoidal vein. Next in order we have the levator ani, and then a soft yielding, adipose cushion filling up the ischiorectal fossa. The vascular supply, derived from the inferior mesenteric, internal iliac, and pudic arteries is returned by two sets of veins into the systemic and portal systems. By the inferior hemorrhoidal, the blood collected from the anus and external sphincter, is poured into the internal iliac. This vein differs from the superior in its compartively short course, and its being provided with valves. The superior hemorrhoidal, commencing in an intricate network, much more extensive than that of the inferior, situated beneath the semilunar valves of Morgagni, ascends into the abdomen as a tributary of the portal.

Thus we see that this vein is pre-eminently disposed to varix, from a variety of causes, viz.:—its length, rendering it so liable to pressure; its opening into the splenic, almost at right angles behind the pancreas; its blood having to pass through the liver; its being unprovided with valves; the tendency of the Morgagnian festoons to obstruct the passage of hardened fæces and favour their impaction; their relation to the venous plexus, whereby this will probably be dragged down, when prolapsus of the mucous membrane occurs from the pressure of impacted fæces; straining at stool, &c.; the laxity of the mucous attachment; the yielding walls of the canal and constitution of the muscular planes during defecation, contribute towards the same result.

The immediate causes of hemorrhoids are such as lessen the *vis a tergo*, or impede the venous current, *a fronte*, the former constituted by general muscular relaxation, and diminished contractility of the hemorrhoidal arterial coats, as frequently results from residing in the West Indian climate. The latter, by mechanical impedimenta, removable or irremovable. Of the removable, constipation is by far the most frequently exciting cause, for, when habitual, the muscular walls of the rectum gradually lose their tone and sensibility, and become more or less paralysed by the excentric pressure of the contained fæces, dilatation succeeds, and the ascending column of blood from the rectum thus pressed on, suffers retardation, is thrown back on the hemorrhoidal plexus, and varix ensues.

In warm climates, in consequence of the rarefaction of the atmosphere, the liver is called into increased activity, to supplement the lungs, and the blood is depurated by the increased elimination of its biliary elements. Thus a tendency to relaxation of the bowels, or diarrhœas, exists at the same time; owing to the debilitating effects of caloric, relaxation of the muscular tunic of the hemorrhoidal arteries takes place with partial paresis of their vasomotor nerves, as may be inferred from the dilated condition of the corresponding capillaries; hence an unusual afflux of blood to the anal region takes place, which, if further augmented by hepatic torpor, or by the constriction of the muscular planes surrounding the gut during a violent diarrhœa, such as is likely to occur in the crisis of a bilious remittent, cannot be directly propelled by the weakened heart through the portal system, and if not finding a ready outlet through the systemic veins, will, necessarily, press with increased gravitic force on the hemorrhoidal venous plexus and capillaries, and these yielding, become varicose, and pushing before them the lax mucous membrane and Morgagnian structures, descend as a hemorrhoidal tumour into the bowel, where, exciting spasmodic contraction of the sphincter, and inducing irritation of the bladder, it becomes the head and front of a series of uneasy sensations, which render defecation a martyrdom, produce constipation, and thereby *emperran el mal.*

For a somewhat similar reason the disease is frequently met with amongst stokers, the heat of the fires producing muscular relaxation, and their stooping and holding the breath, with the diaphragm consequently fixed, during the act of shovelling, increasing the amount of blood in the abdominal veins.

The internal pile, so produced, is broad and vascular, has a tendency to abrasion, bleeding, and inflammation. It may be regarded as the true internal pile, the change of shape, consistence, appearance, or character which it is apt to undergo being the effects of subsequent inflammation and effusion of lymph or blood; it differs from the external in being composed of capillaries, veins, and relaxed Morgagnian columns, in denoting a greater amount of embarrassment in the hemorrhoidal circulation, and in the external, as well as what has been called the intermediate pile, being the result of a minor degree of retardation from pressure, or causes purely local, such as heat, cold, irritation from various sources, &c.

For the purposes of treatment, hemorrhoids may be classed under three heads—1st, those requiring constitutional treatment alone; 2nd, those for which topical applications suffice; and, 3rd, those for which a combination of topical and constitutional remedies are requisite. Under the first head come the true internal pile, and that in which the capillary element is less prominent. Under the second are the external and intermediate piles, whilst the third embraces the cellular, erectile, fleshy, warty, &c., internal piles.

The rationale of treatment is extremely simple, and consists in the adaptation of remedial agents to correct the pathological conditions on which they depend—in other words, to remove constipation, restore peristaltic action, give tone to the paralysed muscular tissue of the great intestine, constringe the dilated hemorrhoidal capillaries by increasing the contractility of the middle coats of their supplying arteries, and thus enable the veins to resume their normal degree of rectitude.

In belladonna we possess an agent capable of supplying by its physiological action all these desiderata. Because, acting through the intestinal branches of the solar plexus, it will increase peristaltic action, and restore tone to the paralysed muscular fibres of the colon and rectum, by which means the bowel may be unloaded and kept in a state of solution, and pressure be thus taken off the hemorrhoidal plexus and semicircular festoons, a desideratum which may be much accelerated by the previous administration of a dose of castor oil, to clear out the bowel and facilitate absorption.

Again, by acting on the vasomotor nerves of the hemorhoidal arteries it will promote the contractility of their muscular tunics, lessen the supply of blood to the trajetanal, and thereby check bleeding, and, at the same time, diminish the size of, and ultimately remove, hemorrhoidal tumours of the first class.

On these data, I was led to the employment of belladonna in those cases 18 months ago, and have every reason to be satisfied with it. In November, 1866, a relative of mine, Mr. M., came under my care for bleeding internal piles of two years' duration, brought on by residence in the tropics, and a severe diarrhœa. The hemorrhoid was large, vascular, very hot, protruded, and bled during defecation ; gave rise to much vesical irritation ; a constant feeling of fulness in the rectum ; constipation ; frequent desire to go to stool ; much mental uneasiness ; emaciation, and general debility. His sufferings were great, so great that they finally overcame a constitutional aversion which he entertained against all surgical operations ; and he submitted to have anything done to give him relief. Having once induced an epileptiform fit in a much stronger patient by touching his chancre with nitric acid I determined to reserve this as a *dernier ressort*, and having cleared out his bowels with a dose of castor oil, I prescribed the fluid extract of belladonna for him in ♏iiss. doses, every four hours, and ordered a lavement of cold water, *bis die*. In two days the bleeding had quite ceased, and in ten days the hemorrhoid had entirely disappeared, and has not returned since, though the laxity of mucous membrane still continues, and causes it to prolapse slightly at stool.

To give a number of similar cases with like results would be a useless repetition. I may, however, mention that I have used it with perfect success in the case of a lady eight and a-half months pregnant ; believing that the gravid uterus acted indirectly by pressure on the fæcal tract, rather than on the veins, and that the consequent accumulation of fæces was the obstructing power to the free return of the venous blood, and knowing that belladonna is extensively used in America during the last days of gestation for dilating the os uteri, I, as she was then suffering a good deal from the bleeding internal pile, put her on two minim doses of the fluid ext. belladonna, *ter die*. A cure was effected in less than a week. I, however, continued the belladonna to the period of her accouchement, and I certainly think it facilitated her labour.

For the external pile the grease which runs from the hot bearings and eccentrics in the engine-room of a steamer when under steam, will be found an unfailing remedy. Chemically considered, it is rather complex in composition, and may be presumed to be a combination of the fatty acids and oil, used as lubricating materials, with the oxides of the more oxidisable metals exposed to friction. By the bearings are meant the fixtures in which the shaft works. They are made of brass and lined, to a certain extent, with a patent metal, composed of copper, tin, and antimony, or of zinc, lead, antimony, and platinum. The shaft is formed of wrought iron, and the brass is composed of copper, zinc, and tin. The bulk, however, of the metals oxidised, judging from a rough analysis I made, is formed of the copper and lead. There was hardly a trace of zinc, and none at all of the others found in a drachm of the ointment.

As the liquified grease drips from the bearings, it is caught in a "save-all," and on cooling is fit for use. It should be mixed with one-eighth its bulk of lard. It then forms an ointment of a pale blue colour, the efficacy of which is so well-known to the stokers that they treat, *sub rosa*, nearly all the cases of piles that occur on board ship. A chief stoker of my acquaintance told me he had treated successfully over fifty patients. He used it indiscriminately for all kinds of piles. From my own experience, I can only vouch for its utility in cases of the external or intermediate varieties; but lately I treated a stoker with it whose anus was festooned with mariscœ, without putting him on the list or getting him excused from duty. He was rid of his garnitures in about a fortnight. It proved equally efficacious in the case of a jockey from the United States, who suffered from the internal, fleshy, and external piles during a number of years, and who had to resign his occupation in consequence. It is needless to say this man had numberless remedies recommended, but *cui bono?* His occupation was gone, and could not be pursued until the ointment gave their *congé* to his unwelcome guests.

For the varieties of internal hemorrhoids which come under the third heading, the castor-oil and belladonna, administered by the mouth, and the ointment applied locally, will usually suffice. How the ointment acts I can only conjecture, but can recommend it with confidence as safe, efficacious, and productive of but very little pain. It will, I think, be generally found that if nature dispenses afflictions to the human race with her left hand, she showers their panacea on us with her right; and if she sends sickness and disease in our midst, she also places their remedies within our reach, and leaves us to find them. To the Bolivians, for their various calenturas, she has given the Calisaya. If the bothriocephali find a commodious habitat in the dura ilia of the vassals of Theodorus, or perhaps in those of his sable majesty himself, has not nature drawn up a process of ejectment in the flowers of the Brayera Anthelmintica, which will not endanger the life of a bailiff to serve?

Do not the natives of the West Coast of Africa, when suffering from dysentery, find its specific in the fruit of the banana, prepared *secundum artem*, and found growing in the greatest profusion? and could she be less bountiful to stokers? No; if she permits the heat of the stokehold to festoon the anus of the stoker, she also prepares in an impromptu laboratory, in which the shaft and bearings, converted into a pestle and mortar, rub up the lubricating materials, and by means of heat, friction, and the atmosphere, produce an unguent calculated to remove his questionable decorations—one which, to use the language of an enthusiastic stoker whom it recently quit of such appendages, "is worth its weight in gold!"—*Medical Press and Circular, June* 10, 1868, *p.* 497.

60.—EXTRACTION OF A SEWING NEEDLE FROM THE RECTUM 5 DAYS AFTER IT HAD BEEN SWALLOWED.

Case under the care of Mr. Hulke, at Middlesex Hospital.

Slender, flexible, though strong objects, as small fish-bones, commonly enough traverse the alimentary canal when swallowed and are voided *per anum;* the same not uncommonly happens when a pin is swallowed. Needles frequently pierce the walls of the canal, and produce grave results. An instance of this, where a needle pierced the aorta and gave rise to fatal hemorrhage, was reported not long since from this hospital.

In the following case, however (for which we are indebted to Mr. Thomas Flower, Senior House-Surgeon), the needle did not cause any inconvenience till it reached the rectum, where its arrival was marked by extreme pain. A man, aged 37, came to the out-patient room January 17th, 1868, stating that five nights before, while drinking a pot of beer, he felt something scratch his throat, but he had not thought anything more of it. He complained now, however, of pain in the lower bowel, so severe that he compared it to a stake being thrust into him. It had come on suddenly the night before, without any assignable cause. No fissure on the verge of the anus or other cause calculated to produce such suffering could be seen, but at the depth of the forefinger what was at first thought to be a pin could be just felt. The sphincter ani was so spasmodically contracted and the examination so painful, that the foreign body could not be removed without chloroform, under the influence of which a slender three-bladed urethral speculum was passed, and a sewing-needle with a loop of thread was removed with forceps. One end of the needle was sticking in the gut while the other end was free and directed upwards. A little soreness continued for a few days, after which no more inconvenience was felt.—*British Medical Journal, July* 4, 1868, *p.* 7.

61.—ON SOME NEW METHODS OF TREATING DISEASES OF THE CAVITIES OF THE NOSE.

By Dr. J. L. W. Thudichum.

I. *The Medical Lantern.*

Those who have tried sunlight for the inspection of the nose or larynx, and compared it with the light given out by oil-lamps specially adapted to the operation, and provided with complicated condensers, must have come to the conclusion that the latter are relatively useless. At all events, my own practice soon made me dissatisfied with such arrangements as Tobold's lamp—instruments which I found top-heavy and unstable, and whose horizontal beam of light did not satisfy my demands for inspection, much less my requirements for illumination during operations. I therefore established a platform before the window of my consulting room, in order to be able to utilise sunlight, thrown into the room by means of a heliostat, on all practicable occasions. Some diagnoses and operations which I had opportunities of making by the aid of this light, and which I am convinced could not have been made with the aid of an oil-lamp, however artfully devised, caused me to construct the following adaptation of Drummond's light to medical purposes:—

A small lantern carries the arrangements which are required for the production of the spirit-oxygen-lime light. The glass spirit-lamp is screwed into the bottom of the lantern, in order that the level of the spirit may be always accessible to the eye. The rest of the arrangements, including an annular ditch round the burner, to be filled with water intended to cool the burner, are inside the lantern. The oxygen is supplied from an iron bottle underneath the lantern, in which it is contained under pressure produced by the condensation in it of several atmospheres of gas. A delicate screw-valve, moved by a lever, easily regulates the flow of gas. The bottle and lantern are fixed to a stand, being a brass rod screwed in a heavy circular iron plate. Any position can be imparted to the lantern by means of the ball-and-socket joint on its attached side, and the screw sliding clamp, which fixes it to the rod. The light passes through a system of condensers in front of the lantern, and can be brought to a focus at any desired distance by the sliding arrangement of the bottom of the lantern which carries the light. The instrument, including the compressed gas, is manufactured and sold by Mr. John Orchard, optician, of Kensington.

The lantern in this form is eminently practical. It is easily lighted: a match inflames the spirit, the lime is fixed by its side, the oxygen is turned on, and within a minute or two a splendid beam of light is projected from the condensers. The direction of the beam is readily adapted to the requirements of the operator. For laryngoscopy and rhinoscopy he carries the concave mirror on his forehead over a screen, which, as the light comes from above, can be so adjusted as to completely protect the eye from any incident rays, and leave it all its pupillary space for the inspection of the illuminated cavities. The lamp is put out as easily as it is lighted: the oxygen is turned off; the lime-cylinder buried in lime-powder in a suitable receptacle; the spirit extinguished by a brass cap which fits into the water-ditch. The amount of gas in the bottle can always be controlled by a pressure guage to be screwed on to the top of it. A full reserve bottle is always kept in store, and any empty bottle is at any time refilled by the maker. I pronounce this apparatus (which I exhibited last year at a *conversazione* at the Royal College of Physicians, and which I have now tried on many occasions during nearly two years), to be perfect, and greatly to be recommended to the profession, particularly for application in hospitals, but quite as suitable for the consulting room of either physician or surgeon.

II. *Rhinoscopy and Nasal Specula.*

Hitherto the inspection of the nasal cavities from the side of the pharynx, choanoscopy, has been practised much more systematically than that through the nostrils. This has arisen through the impetus given to laryngoscopy, of which rhinoscopy was considered to be a mere appendix. But the neglect of what, in contradistinction from posterior rhinoscopy or choanoscopy, I will term anterior rhinoscopy, is mainly due to the remarkable circumstance, that there were no proper specula by means of which this operation could have been accomplished. The only speculum I could find in the shops bore the name of Liston, and was not suitable for my purpose. I therefore constructed a series of specula to suit many cases and requirements, and ultimately retained the following forms as highly practical :—

Two valves are held together by a spring, and when compressed form a canal of oval bore, about $\frac{3}{4}$ in. in length. The valve which expands the ala is from $\frac{1}{4}$ in. to $\frac{3}{8}$ in. longer than the valve which is placed against the septum. This latter inner valve should never be long enough to reach the sensitive part of the mucous membrane of the septum. It follows from this that each nostril requires its own speculum. There must therefore be for each case a right and a left speculum. As the nostrils of different persons vary greatly in size, different sizes of pairs of specula must be at hand in practice. The speculum is inserted into the nostril while closely compressed ; the moment the spring is liberated the nostril is fully expanded, and if the operator now draws the spring, which serves also as handle, upwards, the cavity of the nose can be fully inspected. The speculum, therefore, is designed exclusively to expand the atrium or membrano-cartilaginous part of the nostril ; if it were allowed to enter beyond this, and to reach the isthmus formed by the unyielding cartilaginous septum and the nasal margin of the ascending branch of the upper maxillary bone, it would cause pain, and narrow by its own thickness this small passage. The new specula, several sets of which have been made for me by Messrs. Weiss, cause no pain, widen the atria to the utmost extent, and admit of the introduction through them, into any part of the nose, of instruments necessary for slight, delicate, or severe operations.—*Lancet, Aug.* 22, 1868, *p.* 243.

62.—ON THE OPERATION FOR NASAL POLYPI.

By Dr. J. L. W. Thudichum.

The operation for nasal polypi, as hitherto practised in all countries, consisting as it did in the tearing out of these growths by means of a pair of forceps, has always, and more particularly when I was obliged to perform it myself, appeared to me one of the most barbarous proceedings of surgery. The bruising and general injury to the nose were very great ; one or other of the shell bones was mostly broken ; the bleeding was always profuse ; and the suffering of the patient was so extreme that it required the greatest enargy on his part and on that of the operator to enable him to endure to the end. Very commonly the patient and operator had the mortification of finding the polypi to grow a second and a third time, or to relapse even more frequently than that ; many persons who had had one taste of the operation dreaded its repetition, and kept their polypi. The operation could not be ameliorated so long as the instrument used for it filled the entire introitus of the nose—so long as the blades of the forceps, however thin they might be, had to be opened in a narrow and unyielding canal—so long as the objects to be seized could not be seen at the time of seizure. A usual result of the proceeding was that small polypi were jammed up into the narrow parts of the cavity, and were thus made the certain origin of subsequent growths, or so-called relapses. In almost all cases the sense of smell, which had been only impaired by the polypi, became totally lost after the operation. I therefore threw aside the forceps altogether, and endeavoured to apply the electro-caustic method, which had not heretofore been used for this operation, and was rewarded with the most perfect success. Indeed, operations in the nasal cavity may now be made to vie in delicacy with operations upon the eye, and the opprobrium so acutely felt by most surgeons with whom I have had an opportunity of conversing, is now removed from this chapter of science, and from this drawer of the surgical armamentarium.

Besides the medical lantern and the specula it requires the following apparatus :—

1. Platinum-wire, loop-carrier and pully, with handle. The loop-carrier must be so thin that, while it is in the nostril, the eye can see the interior of the nasal cavity. It is therefore made of two very thin gilt brass tubes, isolated from each other by a layer of unspun silk wound round the tubes and varnished with shellac. The part of the loop-carrier which during the operation remains outside the nose is so bent aside or downwards that it is neither in the way of the eye nor in that of other instruments. This loop-carrier is fixed in the conducting handle, which bears the windlass. The handle and windlass which I use are copied from Middledorpf's instrument, made by Pischel of Breslau, exhibited in the last London Exhibition, and now in the possession of St. Thomas's Hospital.

2. An electrical battery of five large Grove's elements, mounted in the best style, with platinum plates and gilt incorrodible connexions. The power yielded by such a battery is sufficient to make any necessary length of platinum wire white-hot; it is serviceable for all other electro-caustic operations which occur in surgical practice; and such a battery has therefore, at St. Thomas's Hospital, taken the place of the much too powerful and unwieldy, and in the working much less economical, instrument supplied with the Exhibition instruments from Breslau.

3. Connector and conductors. Formerly, wherever the electro-cautery was applied the services of a special assistant were required to establish connexion and let the current pass. This was so highly inconvenient that I had an instrument made by

the aid of which the operator could at any time make and interrupt connexion by means of his foot. In the engraving the right foot of the operator is in the act of pressing down the button fixed in the end of the board on which the battery stands, and on the under-side of which the circuit is by this action established. A spring in connexion with this button is made of such strength that the mere weight of the foot does not bear it down; it is necessary to put the foot strongly on the button in order to establish connexion.

We will now suppose everything to be arranged: the lantern burns brightly, and the mirror fixed over the shade before the eyes of the operator throws a brilliant light into the nasal cavity of the patient; the head of the patient is resting against the assistant, who steadies himself by means of his left hand on the back of the chair, and with his right holds the speculum upwards, resting his thumb gently on the patient's forehead; the loop of soft platinum-wire is introduced into the carrier, and connected with the windlass; it has been white-hot a moment before, and is now cool again. Everything is ready, and the operation proceeds. The platinum loop is passed over the polypus; it is then constricted round its pedicle by means of the windlass; connexion is made with the foot, and after a slight hissing noise indicating the burning off the pedicle of the polypus, the growth, mostly yet attached to the platinum, can be withdrawn from the nose entire. There is usually no bleeding, and the place where the polypus was attached is marked by a white stripe or spot. The patient has suffered some irritation from the instrument, and perhaps been obliged to sneeze, but after the use of his pocket handkerchief is quite ready to proceed to the extraction of the next polypus.—*Lancet*, *Sept.* 5, 1868, *p.* 307.

63.—ON THE TREATMENT OF CORYZA, OR NASAL CATARRH, BY "A TOTAL ABSTINENCE FROM LIQUID."

By Dr. C. J. B. Williams.

[Dr. Williams in the article "Coryza," published in the Cyclopædia of Practical Medicine in 1833, after giving the usual treatment by aperients, diaphoretics, and diluents, adds:]

"It is the acrimony of this discharge (from the pituitary membrane) which reacts on the membrane and keeps up the inflammation and its accompanying disagreeable symptoms. On this circumstance depends the efficacy of a measure directly opposed to that just noticed, but to the success of which we can bear decided testimony—we mean *a total abstinence from liquids.*" "This method of cure operates by diminishing the mass of fluid in the body to such a degree that it will no longer supply the diseased secretion." "The coryza begins to be *dried up* about twelve hours after leaving off liquids; from that time the flowing to the eyes and fulness in the head become less and less troublesome; the secretion becomes gelatinous, and between the thirtieth and thirty-sixth hour ceases altogether. The whole period of abtsinence needs scarcely ever to exceed forty-eight hours."—*British Medical Journal, June* 6, 1868, *p.* 554.

URINARY ORGANS.

64.—ON LITHOTRITY.

By Sir HENRY THOMPSON, Bart.

[The history of the instruments employed in lithotrity is interesting. The instrument in present use is a great improvement upon the original one of Civiale. It is due in part to Sir Henry Thompson's own design, and in part to Messrs. Weiss.]

In what respect does it differ from others? In this, that it enables you to operate in less time, and with less movement or shock to the bladder, than any other instrument; and time, you know, is a matter of importance. It makes a good deal of difference to a patient whether you retain in his bladder an instrument for three minutes or for one minute. If you pass a bougie into your own bladder at once and withdraw it, you may experience very little discomfort; but leave it there for three or four minutes, and see how you like it. Every half minute after the first, the pain increases. The mere sojourn of the instrument in the bladder is a source of irritation precisely corresponding to the time it continues there. Anything, therefore, that will diminish the time of the operation and the amount of movement and concussion will necessarily give you a greater prospect of success.

Now for the proceeding itself. There is no operation that I know which demands attention to so many minute details, all of them being very important. For its successful performance it is essential that the surgeon should not only attend to the operation pure and simple, but to all the details connected with the case. Lithotrity neglected had better not be done at all. Either let it be done according to certain principles, and with great attention to detail, or let lithotomy be performed instead. One naturally recoils from many details; it is therefore essential to find out what principles regulate them. And, happily these are very simple. What is the problem to be solved? It is to remove a stone from the patient's bladder without inflicting a wound, however small, either in employing the instruments or in removing the fragments. That is what we have to aim at.

Now, I need not say that by any cutting operation that is impossible. There is at the outset a severe injury to the patient in the shape of a large and deep wound, and it is this which, in any form, is always a risk. Let us see how far we can hope to solve the problem by lithotrity. All the chances of injury possible arise from these two sources: the stone itself, and the instruments used to extract it.

First, the stone. In its natural condition, as we know, it occasions no dangerous injury to the bladder, although it causes much pain, and ultimately chronic disease. But when it is broken up into large angular fragments with sharp edges, it becomes a source of injury, and severe cystitis may be thus readily induced. These should be pulverised one at a time; you do not attack them all at once, and break them up indiscriminately into sharp pieces. Then you will take care that this debris is not hurried away when first made, and while it is sharp; if it can remain in the bladder two or three days before it passes, it will become somewhat waterworn, and will pass more easily; at the same time the urethra will be less sore, and in better condition for its transit. It is as well also sometimes to promote the flow of urine by giving diluents and diuretics. Secondly, the instrument used, and the method of manipulating it, may be productive of much injury both to the bladder and to the urethra. It has therefore been an object with me to lessen as much as possible the number of instruments employed, the amount of manipulation applied to them, and the time devoted to the process. I have shown you how, in conformity with this principle, I have endeavoured to produce an instrument which should give the least possible irritation. And I will only add that if we can get an instrument which will do its work with less disturbance still, it will be, *pro tanto*, a valuable step in advance.

Now as to diminishing the number of instruments used. Formerly it was laid down as an axiom that you should never use a lithotrite in a patient's bladder unless it contained a known quantity of urine or other fluid. Hence the urine was always withdrawn before introducing the lithotrite, and four or five ounces of water were injected. I have shown that these preliminary injections are wholly unnecessary, and I never use them—never even asking a patient to hold his water beforehand, nor when he micturated last. I am perfectly indifferent whether he has one ounce or four ounces of water in his bladder, objecting only to a large quantity. If there is a small stone, with a large quantity of water, you may hunt long before you find it—a proceeding which will give much more pain and uneasiness than if a small quantity of water only were present. It is said, "If there is only a small quantity of water, how can you be sure that you will not injure the coats of the bladder in endeavouring to seize the stone?" There is no difficulty in that respect, because these instruments are so constructed that you could scarcely lay hold of the bladder with them if you tried to do so. When you had instruments in which the blades closed upon each other accurately it was different. But these blades never do so: hence the safety of the instrument.

Then there is another species of mechanical irritation which may be met with. It was common, and it is now with some surgeons, to withdraw large fragments of stone from the bladder through the urethra. The surgeon would lay hold of them with the forceps, or with some other contrivance, and would really seem to think he accomplished something to be proud of if he drew from the bladder a calculus as large as a bean. Now in order to draw out such a calculus you must first catch it. Well, if you have once caught it, why not give one turn of the screw and reduce it to powder? Why subject the neck of the bladder and the urethra to pain and injury by dragging through a distance of six or seven inches a sharp angular fragment of stone? So far from looking upon it as an achievement in surgery, I look upon it as a thing especially to be avoided. Never, then, on any pretence, withdraw an instrument containing a fragment or débris too large to pass easily through the urethra. Our object is mainly to crush the stone into small broken material, which will then pass harmlessly and easily enough. Again, it was the custom after crushing to inject repeatedly and forcibly several ounces of water into the bladder, the patient being placed upright in order to remove the fragments just made. Now this is an irritating process, more so often than the use of the lithotrite, and for the reason just named I regard it as a useless and meddlesome proceeding. You see then that we get rid of the preliminary injections, the after injections, and also the withdrawing of the fragments. As a rule, everything is to be done with the lithotrite. One good flat-bladed lithotrite will do seven-eighths of all the work. Other means, Clover's apparatus for example, which is the best of all, should be employed in exceptional cases.

Having enumerated what I believe to be the simple principles of lithotrity, I now come to the practice. Usually when you have a large stone to deal with, you begin with the fenestrated instrument—that is, one in which the female blade is entirely perforated, allowing the male to pass through it. This is always a more or less dangerous instrument; hence it is used as little as possible. I never use it unless the stone is actually so large that it cannot be crushed by the flat-bladed instrument. The edges of the instrument exactly meet, and are sharp, and the fragments made by it are always rough and irritating. Always when it is possible I use the lithotrite with flat blades—blades which reduce the stone to powder. The blades do not meet each other, and cannot catch or hurt the bladder, and the movement altogether is easier than that of the other instrument. [A patient is placed on the table.] I have told you that there is a difference in the mode of introducing the lithotrite and the catheter. You know that in passing a catheter, we in this country, stand on the left side of the patient; in France the surgeon stands on the right side. In passing the catheter for a recumbent patient you hold it somewhat horizontally; draw the penis gently over it, and give a gentle sweep, in this way, into the bladder. In passing the lithotrite a different movement is required. You may stand on either side, but it is better to be on the right side, because that is the convenient side for operating, and it is awkward to go round the patient to operate after passing the lithotrite. Well then, standing at his right side, and partly turning your back to him, you let the lithotrite slowly and easily find its way until the shaft reaches nearly the vertical direction. Arrived at this point you retain it in that position for a few seconds, allowing it to go on in that position by its own weight, in order that it may slip under the pubic arch. This done you gently depress the handle, and it slides readily into the bladder. There is no more easy instrument to pass than the lithotrite with ordinary management. I have now introduced the lithotrite, and have to find the stone and seize it. In order to do this I simply open the blades and close; the stone is between them. I touch the little button here, which changes the sliding movement into a screwing one, turn the handle and crush. I then disengage the button, again open and close, and now I have a large fragment between them, and, repeating the action, again crush. A good quantity of débris results; less than a minute has been occupied, and I withdraw the lithotrite slowly and gently, and here is the débris, which you see is uric acid, between the blades. There is no trace of blood, and the patient has made no complaint of pain. If you ask him he will, I dare say, tell you that it was not agreeable; but it is nothing to take chloroform for—nothing like extracting a tooth, for example. Now we will have another patient [who is placed on the table, the other walking away]; he has had two sittings before, and knows all about it. I introduce the instrument in the same way as before. I open and close the blades, and find nothing. Turning them to the right, I feel nothing; turning to the left, I feel nothing. I then depress the shaft, and turn the instrument over, so that the blades are reversed and point downwards; I open and close, and seize a small fragment deep behind the prostate. Having crushed that piece, I open and close in the same position, and find one a little larger, and having crushed it I withdraw the instrument. This is always rather more painful for the patient than when the stone is found in the usual situation, and it occupies more time, perhaps two minutes instead of one. It is not usual to have a case of so much difficulty as that.

Now let me give you a hint about crushing, which is a very useful one. Whenever you have found a stone, or a good-sized fragment, and have crushed it, keep the lithotrite exactly in that place, and although you may have had some trouble in finding it, you will now continue to find it several times running. It reminds me of fishing for perch; when you have caught one, you may catch, perhaps, twenty or thirty more out of the same hole, if you will but stop there, and not go fishing about among the shallows. It is the same in lithotrity. You will go on seizing and crushing if you contrive to keep the lithotrite precisely in the same place. In fact, there is what may be called a certain favourite "area" in every bladder in which to operate—a certain spot which is a favourite haunt, so to speak, for fragments of stone. If you find that out in each bladder you will always be able to crush; if you do not, you may often have some difficulty in discovering your stone. The area will, of course, vary somewhat with the position of the patient. If the patient was standing, for instance, the area would not be the same as in a lying posture. It is best to raise the pelvis two or three inches; then you get an area for operating which is not too close to the neck of the bladder. The neck of the bladder is a very sensitive part, and you should always avoid it, because in pulling out the male blade you may impinge against the neck of the bladder if you are not careful. One of your maxims in lithotrity should be never to pull out forcibly the male blade. You should pull it out carefully and delicately, so as to *feel* the neck, and it is a bad lithotrite remember, if the male blade does not slide with perfect ease.

Now suppose that we have—at five, or six, or eight sittings, according to the size of the stone—almost if not quite removed it, a very important duty remains. It has been objected to lithotrity—and there was some truth, perhaps, in the allegation formerly, but not now, if the operation is done well—that you never made sure of getting rid of the last fragment; that you might leave a portion to become the nucleus of a future stone. But there is very little more difficulty in getting away the last fragment than any other, provided you go the right way to work. Generally speaking, in four cases out of five, the last fragment passes as the others—that is, by the patient's natural efforts. But supposing there remains a bit too big to pass—suppose you have reason to believe this from the continuance of the pain, &c.,—you then take an instrument with short, wide, rounded blades, with which you can explore easily in the reversed position. With such an one you may thus search the whole floor of the bladder with perfect safety. Now supposing you have done this, and have found a bit of stone, and do not know whether there is another—some little symptoms are left, but you do not find any more,—what is to be done? You do not know whether these symptoms are due to a fragment of stone which escapes you, or whether to the irritation arising from the long residence of the stone in the bladder, and also, to a certain extent, to your instrumental efforts to find it. This is what I advise: wait for a week and see whether the patient is better, and, if there is any doubt at all about it, make him take some severe exercise. I do not know anything here in London better than a long omnibus drive. Tell him to expend a shilling in omnibuses—say, between Mile-end and Kensington—and if that does not find out the fragment in the man's bladder I scarcely know what will. If he can stand that, especially if the roads are mending—if he is not worse for such a journey,—rely upon it he has not any fragment left: the irritation is due to the state of the bladder, and not to a fragment. If the latter exists, the patient will to a certainty be the worse for his drive, and, perhaps, there may be some bleeding. I admit that it is difficult to tell sometimes what the irritation is due to; and it is only by waiting and testing in some such way that you can find out.

Then there is a another very good mode of getting rid of the last fragment, and also of removing fragments at any time when they are not well expelled by the natural efforts. I mean the apparatus of Mr. Clover, who, well known by his chloroform instrument, has also given us a valuable addition to the instruments for lithotrity. It is a very fascinating apparatus, and looks so well that there is some risk of its being used when not required. There are certain conditions in which the fragments never come away well. For example, a patient has no power of making water, except by a catheter; then few fragments, probably, will be passed in that way, and you will require other means. For him the apparatus in question is the very thing. After crushing, this large catheter is introduced, and the fragments are sucked out by the action of this powerful india-rubber bottle which is attached to it. The process is rather trying, however, for the bladder; and it costs rather more pain and time than an ordinary sitting for lithotrity.

One troublesome thing that very rarely happens is the impaction of a fragment. If you adopt the system of lithotrity which I have shown you, it is remarkable how seldom that happens. I have never had to open the urethra to remove a fragment in my life. I have occasionally had to remove one by the forceps, but that is very rare; and among all the complicated inventions for the purpose, I know nothing so good as the common long forceps which I show you here. During the last year, certainly, I have not even had occasion to use them. The more thoroughly you crush the stone, the less use there will be for forceps. Here is a bottle containing what I call a well-broken stone. You see it is almost powder: a very different sort of thing from that in the other bottle, where you see a large number of big fragments that were probably passed with difficulty. It is an old saying, "a carpenter may be known by his chips:" certainly the skill of the lithotritist may be known by the *débris* he makes.—*Lancet*, *May* 16, 1868, *p.* 611.

65.—REASONS FOR PREFERRING LITHOTRITY TO LITHOTOMY IN OPERATING FOR STONE IN THE ADULT MALE.

By Dr. GEORGE BUCHANAN, Surgeon, and Lecturer on Clinical Surgery, Glasgow Royal Infirmary; Lecturer on Anatomy, Andersonian University, &c.

[All seem agreed that as a general rule lithotomy in children is preferable to lithotrity. The point of practical interest is the selection of adult cases suitable for lithotrity.]

Now there are some cases in which I think there need be no hesitation at all: where the stone is of small or moderate size, the patient otherwise in fair health, and the bladder and urethra in a normal state. In such circumstances lithotrity may be undertaken with an almost certain prospect of success.

The doubtful cases depend on circumstances connected with the stone or the patient.

1. The stone. I believe it may be taken for granted that a mulberry calculus exceeding three-fourths of an inch in diameter should not be so treated, from the force necessary to crush it and the sharp irregular form of the fragments. That a smaller stone of the kind may be successfully crushed I have myself had experience, but all large mulberry stones must be removed by lithotomy.

Excluding these, it may be asserted that all small and moderate-sized stones may be removed by lithotrity. No exact limit can be assigned to the size of a calculus which may be so treated, but obviously it depends somewhat on the composition and texture of the stone. Recent experience has shown that, in the hands of most lithotritists, stones of very large size have been removed with perfect safety. I have myself removed by lithotrity a calculus the debris of which weighed one ounce and one drachm of mixed urates and phosphates, and many larger have been removed.

So far as the stone is concerned, those cases are to be excluded in which the calculus is of exceptionally large size, or of oxalate of lime over three-fourths of an inch or an inch in diameter.

If, then, it can be shown that by detecting a stone when it is of moderate size, the medical practitioner is in a position to recommend to his patient an operation which is less fatal in its results than that which alone is open to him in the later stages of the disease, a more serious responsibility lies on the members of our profession than hitherto. It is true that it is the duty of all to endeavour to make an absolutely correct diagnosis at the outset of any disease ; but in this instance a mistake produces delay, which not only renders the patient less able to undergo any operation, but may prevent the surgeon from choosing the safer proceeding which he would have adopted had he seen the patient at an earlier stage Every surgeon knows how often a single examination fails to detect a small stone ; and also how often symptoms of stone are allowed to exist for a long time without a systematic examination in cases where there is enlargement of the prostate and atony or chronic inflammation of the bladder. In these latter instances, when another surgeon is called in consultation, and, seeing the case and hearing the symptoms for the first time, suggests a systematic examination, the detection of the stone often seems to take by surprise the ordinary attendant, who has watched the gradual accession of the ailments, and has attributed them to the concomitant disease of the prostate and bladder. In all cases, then, which present any of the symptoms of stone, I believe that it is the duty of the medical attendant to make periodical systematic examinations of the bladder.

2. The circumstances connected with the patient which make lithotrity doubtful are general debility, stricture, enlarged prostate, atony of the bladder, and chronic cystitis. Any of these conditions would of course militate against either form of operation, but some of them are specially unfavourable for lithotrity. Obstinate and long-continued stricture is obviously a great bar to the successful removal of a stone by crushing ; but, contrary to what was at one time supposed, atony of the bladder, even with a moderately enlarged prostate, is not to be considered a contra-indication. The absence of irritability in this condition is considered by the best lithotritists to afford unusually good opportunities for the employment of a smooth scoop, by which the debris may be removed as rapidly as by the stream of urine

in ordinary cases. Chronic cystorrhœa may frequently be improved by a judicious course of treatment; but that condition so frequently depends on the presence of the stone that its removal affords the proper conditions for further improvement.

In cases of very much enfeebled health and exceptionally enlarged prostate, the question is rather whether any operation should be performed at all; but if decided on, the greater safety lies in lithotrity if the stone is small, and lithotomy if the stone is large.

There are few questions which demand a greater exercise of sound judgment than the decision as to whether a patient with stone in the bladder should be advised to submit to operation, in the circumstances referred to in the preceding sentence. There is, on the one hand, the extreme danger of a fatal result within a few days; on the other, the excruciating agony without hope of mitigation by any other course of treatment. It is not surprising to know that frequently the patient himself prefers the greater danger with the hope of relief, to the unending torment with no prospect of abatement. It seems the duty of the surgeon to state the case as fairly as he can, and leave the decision in the hands of his patient, biassing him in one way or the other according to the gravity of the case. Of course there are some instances where no one would agree to operate at all; but these must be very few and exceptional. In many examples on record, the surgeon has undertaken the case as a last resource at the urgent request of the patient, and has had good reason to congratulate himself on the result. This applies equally to both operations, but I refer to it just now in connexion with the question as to what circumstances should deter us from operating at all. In a case which I had lately, where the stone had been in existence, and of considerable size, for many months,—and where there was enlarged prostate, atony of the bladder, chronic cystitis, and enfeebled health,—I felt bound to give a very guarded opinion; but as I could not exclude the hope of recovery, the patient himself elected to have the operation, lithotomy, performed, saying the agony was too great to be endured any longer. In similar instances we are, I think, bound to give the patient the chance of recovery unless in exceptionally bad cases.

I think I have now touched briefly on most of the points of interest which assist us in determining the question of lithotomy or lithotrity in particular examples. I am aware that the discussion of these topics might be extended to almost any length, and I know that they are treated systematically in the standard works on the subject. But I have thought that they might be introduced here in a concise form, so that they may be looked on as the ground on which I believe that in many instances in the adult, calculi may be removed with more safety by the crushing than by the cutting operation.

With regard to the pain and suffering during the period of treatment, so much depends on individual constitution that no general conclusion can be drawn. Lately I had two typical cases which made a great impression on many of the students who witnessed the treatment in each case. One was a boy two and a half years of age, from whom I removed a calculus weighing ten grains by the rectangular lithotomy. He made a very perfect recovery, being discharged with the wound completely healed in three weeks after the operation. During the time the wound was open he screamed with pain each time the urine was evacuated, but no untoward symptoms arose. The other case was that of an adult who had a small hard stone. I crushed it on four occasions, at intervals of two days, and he was dismissed perfectly cured, after a fortnight's residence, having been confined to bed only one day during the whole time. Of course this is an unusually fortunate example; still, in most that I have seen, the pain or suffering, where there was any, was limited to the time when the operations were performed, and when excessive could easily be mitigated by chloroform.

There is one objection to lithotrity frequently urged, which I must notice. It is stated that there is a greater frequency of a return of the disease after the crushing than after the cutting operation. This assumed consequence is attributed to the retention in the bladder of some small fragments that may have eluded the final search of the surgeon, or to an alteration in the lining membrane of the bladder produced by the use of the instruments, which tends to cause phosphatic deposit. But I know of no evidence to support this assumption. I am very unwilling to quote my own experience in this matter, but in the absence of any other, I can do nothing else. I know of two cases in which lithotrity was followed by the formation of another calculus some time after; just such cases as would be quoted in evidence of the above assumption; but in each case the new formation was clearly to be attributed to the constitutional tendency and not to faulty operation. In one case the stone was formed many years after a small one of a similar nature had been crushed and removed by Sir Benjamin Brodie; and after the second one was removed, a third made its appearance two or three years subsequently.

In the other case, a uric calculus was formed two years after the operation of lithotomy in which two stones were removed. The third one was crushed, and was followed in a year by another; that was followed by another, which was detected when so small that a single manipulation removed it; since which time the patient has not had a symptom. In the May number of the Edinburgh Medical Journal, there is an account of a case in which lithotomy was performed three times at intervals of some years; the calculus being reproduced after complete removal. Until I find evidence to the contrary, I am justified in believing that relapse is not more frequent after well-performed lithotrity than after lithotomy.

But an important method of *preventing* the re-formation of calculus remains to be mentioned, which has been recommended as a part of the after-treatment of lithotrity. I allude to the practice of washing out the bladder with a stream of tepid water. This can be done very effectually by the patient himself, by means of a gum-elastic catheter and india-rubber bag. The water may be made astringent or slightly acid, or alkaline if desired, according to the nature of the case. My experience is too limited to entitle me to give any opinion as to its effects after lithotrity, but in an analogous case the benefit was very striking. A young man with urinary symptoms consulted Dr. J. B. Cowan, who, finding some of the indications of stone, sent him to me. A very careful examination with the sound satisfied Dr. Cowan and myself that there were no calculus. There were occasional slight discharges of blood, just enough to tinge the urine. There was a considerable quantity of mucus and phosphatic sand in the urine; the latter occurring in bits the size of a small pin's head. The patient was ordered a tonic regimen, and advised to wash out his bladder daily with a solution of acetate of lead, one grain to two ounces of water. This he continued for a month with manifest improvement; then the injections were made weekly, and at the end of three months every trace of the former affection had disappeared. I have no doubt, that if the precaution referred to had not been adopted, he would have become the subject of a phosphatic calculus in the bladder. The same treatment, I am informed, has been effectual in preventing re-accumulation after phosphatic calculi have been removed by lithotrity; a well-known example of which was the case of the late King of the Belgians.—*Edinburgh Medical Journal, July* 1868, *p.* 6.

66.—ON LITHOTOMY.

By Sir Henry Thompson, Bart.

I now come to the mode of performing the lateral and the medio-bilateral operations, and will give a few general hints which will apply equally to either. As I have said before, when we have to do with many details, let us try to revert to first principles, and define clearly the object we aim at. I told you that the object of lithotrity is to remove the stone without injury to the patient either from the stone or the instrument. In lithotomy you must have a wound, and the object is to make it in such parts as shall least endanger the blood-vessels, the viscera, or the neck of the bladder, and to remove the stone through the lower outlet of the pelvis with as little mischief as possible to any of those parts. When that problem is best solved we shall have the best form of lithotomy.

Now, in order to aid you to solve the problem for yourselves, I have placed before you a diagram drawn accurately from the preparation, showing the bones and ligaments of the pelvis, in the position for lithotomy. The lower outlet is opposite to us; it is in the patient filled by soft parts, and it is the opening into which you have to cut, and through which you must remove the stone, and in all that you do, you must be limited by its boundaries of bone. I like to have that in my mind's eye when the patient is tied up and I take my seat to operate. Here also are diagrams, showing two stages of the dissection of the perineum. I take it for granted that you know your anatomy too well to require any detailed account here of the important parts involved in the operation. I shall simply name those which concern us. First, there is the pudic artery, safely sheltered under the pubic ramus; but it gives a branch to the bulb, a vessel to be avoided at the upper part of the space. Then in the same part is the bulb of the urethra, which is not to be thought too lightly of; indeed it is the source of some of the chief dangers; it is a vascular expansion from the vessel named, and cutting into it is as bad as cutting into the vessel itself, if not worse. Next there is the rectum in the middle and lower part, which it is also important to avoid. The other diagram shows the position of the prostate, which must be divided in the deep incision.

I will now briefly touch on the principal steps of the operation. The patient's bowels are to be thoroughly emptied by an enema a few hours before. Do not trouble yourself about the quantity of urine in the bladder. Some think it very important that it should be full. Cheselden, on the other hand, preferred it to be empty, saying that in this condition the stone was easily found close to the neck of the bladder.

The first thing the operator does is to pass the staff into the bladder and find the stone. Never think of cutting a man if you are not perfectly satisfied that the staff is in contact with it. Frightful blunders have been made through indifference to this rule. Suppose for example, the staff is in a false passage, and is not in the bladder at all: one shudders at the idea of an operation performed on a staff so placed—an exhibition distressing to all concerned—never to be forgotten either by the operator or the bystander, and probably fatal to the patient.

The "click," then, is to be distinctly audible to yourself and to a witness, and the staff is to be put into the hand of your best friend, who is to attend implicitly to your instructions, and to no others, whatever they may be. The patient is then to be tied up firmly; better still if secured by these leather anklets and wristbands, devised by Mr. Pritchard, of Bristol, because they truly realise the proverb "fast bind, safe find," which our old friends the garters often did not.

Now, what are the instructions to your friend the staff-holder? You want it held firmly, and, of all things not to leave the bladder. I don't think you will gain much by cultivating a fancy for any particular spot, such as right or left, or projecting in the perineum. If it is to be steady and in one spot, which is the main thing, there must be a point of support for it to rest against, and there is but one such spot in the whole region. Rely, upon it, then, you had better tell him to keep it close to to the arch of the pubes, well hooked up, with the handle pretty nearly vertical. Your fingers now traverse the region and find the lines of the rami, also the condition of the bowel, whether empty and contracted, or the reverse.

Now, relative to the first incision, different authorities advise different places at which to enter the scalpel and commence. Without discussing these, let me say that, as a rule, the usual spot should be, for an adult, an inch or an inch and a quarter in front of the anus, a little on the left side of the raphé. Go in boldly, slightly pointing upwards, near to or into the staff, and then gradually less deeply till you come out about three inches lower down towards the inner side of the tuber ischii. It is very pleasant to feel that you touch the staff in that first incision, and it saves trouble and uncertainty to have gone close to it, which you always ought to do; never let it be a timid, shallow cut, merely dividing the skin. The left index-finger follows, and should feel the staff easily through the tissues. Fixing the finger-nail upon it, the point of the knife is fixed firmly in the groove, and is run steadily on in contact with the staff. Keep the point up and you will be safe; let it down and you may slip out and get into the rectum, or nobody knows where. Simply go on, letting the blade be a little more horizontal as it proceeds. Go on till you are well into the bladder, not letting the point leave the staff. The depth of the incision will depend upon the angle which the knife makes with the staff; if you withdraw with the knife close to the staff, of course you will only make a wound the width of the knife; and if the edge is directed outwards and downwards against the soft parts, with a light hand, as you come out, you will make a freer and cleaner opening. It is better to be rather free in cutting than otherwise [the presence of a large stone is assumed], but you must not make the incision too wide. There has been a great deal of good advice expended about this subject, the depth of the incision, but it is manifestly impossible for one man to make another understand what he means or what he does by any amount of talk. My belief is, however, that the result of our anxious care about this matter is, practically, that we are apt to cut rather too niggardly than too freely, and that the neck of the bladder, in consequence, receives severer injury from the stone and forceps than it otherwise would receive from the knife. This relates of course to adults; for in children you can scarcely find the prostate—it weighs but a few grains, and does not come in for a moment's consideration, and your knife goes far beyond its limits; yet these little patients are the safest to cut. Of course there is a very great difference in the two ages, due to the different conditions of puberty and childhood. To return. The incision being completed, your left index finger immediately follows close along the staff into the bladder, where you will probably just touch the stone. The finger goes firmly and deeply in, stopping the urine perhaps to some extent in its outflow, and accomplishes some dilatation of the parts. Then you slide the forceps closely along the palmar surface of the finger, and insinuate them into the bladder, which makes dilatation No. 2. Then, generally speaking, you have but to open the instrument carefully, yet widely, one blade flat at the bottom of the bladder, the other towards the top, and, closing the blades, the stone is probably between them. If it seems that you have a good hold, draw gradually outwards and downwards, easing or adjusting, if you can, with the left index; and so you make the third and last dilatation. Remember not to pull out horizontally and bruise the parts against the pubic arch, but downwards into the widest part of the lower pelvic aperture. [Diagram.] And don't be hurried for the sake of anybody else. You and your patient are to be, for you, at this moment, the only persons present, and your responsibility to him must never be forgotten for an instant through the influence of bystanders and lookers on.

I must now briefly add that you will search for a second stone, tie any vessel spouting within sight, insert the tube into the bladder, and stuff the wound round it if the hemorrhage is free. The patient is placed in bed on his back, with one or two pillows under each ham, and the parts involved exposed to air and light, so that you see how the urine flows. The less meddling afterwards generally the better.

I have only time to say a word or two about the median and medio-bilateral operations For the median, an incision is made in the line of the raphé from about two inches and a half above the anus, downwards as near to its margin as is safe, for you want all the space you can get. Dissecting down to the staff, with a finger in the rectum, and opening the urethra in the membranous portion or thereabout, you carry a director on into the bladder; your finger follows, and dilates, and then the forceps on that. Manifestly this will not do for large stones, which mainly thanks to lithotrity, are what we have to deal with now. Hence the applicability of the "median" is extended by making it "medio-bilateral," and in this manner. Having performed the median, as just described, up to the point of opening the urethra, instead of introducing a director, you introduce the two-bladed lithotome, and when it is in the bladder you open the blades, and two moderate incisions are made, one right, the other left, as you draw the opened instrument outwards in the groove of the staff. These two operations I have now performed about thirty times, and I do not know, after all, that there is much to choose between them and the old "lateral." To make an accurate estimate, one requires at least 100 cases of each operation by the same hand. Nevertheless, I may say a word, finally, on the principle which essentially distinguishes these operations. They are the result of opposite convictions respecting the hazard of the knife. There is a set of men to whom anatomy is a bugbear, and who are afraid of cutting as much as is absolutely necessary; and there are other men less timid—mind, I don't say less cautious,—who regard the larger, freer style of operating as better than the small or fearful style. All surgeons, of course, tend more or less to fall into one of these two classes. The anatomical school have devised a variety of median operations in order to avoid certain blood-vessels, &c. and they sacrifice space in doing so. They answer excellently well for small and medium-sized stones; but these are or should be crushed now, and we do not want any operation for such stones. The perineal operation which offers the most room, the recto-vesical excepted, is the lateral operation. All the others named are essentially median operations. Now I am bound to say that formerly, judging theoretically, I had a leaning to the median method, being disposed to think that it would be attended with less hemorrhage than the others. But I do not find this so in practice, and I have arrived at the conclusion that there is quite as much bleeding as in the lateral operation. I attribute this to the bulb. I regard the bulb as a large artery to all intents and purposes. You cut into that spongy tissue—not in all cases, but in some,—and there is as much bleeding as if you cut the artery of the bulb, and more difficulty in controlling it. The bulb must be cut more or less in the median operation. The problem is how to get into the bladder without wounding the bulb, its artery, and the rectum; and I believe that a well-performed lateral operation accomplishes this, where a free opening for a large stone is required, better than any other.—*Lancet, June* 6, 1868, *p.* 709.

67.—ON SOME RECENT IMPROVEMENTS IN THE OPERATION OF LITHOTOMY.

By Dr. Andrew Buchanan, Glasgow.

[The following article which was published as a letter addressed to the editor of the Lancet, was elicited by that of Mr. Hutchinson, contained in our last volume of the *Retrospect*, p. 236.]

The idea of confining the section both of the external parts and of the prostate gland to the mesial plane in front of the rectum was shown by Dupuytren more than half a century ago to be utterly impracticable for all stones of ordinary magnitude; and yet this operation, under the ambiguous generic name of "median," (proper specific name, medio-vertical,) has been for some years past occupying simple minds in this country as something quite novel, and big with vast results.

The mesial plane enables us to penetrate by the best road into the bladder, and this constitutes the distinctive character of the "mesial" or "median" operations in contradistinction to the lateral, where the knife penetrates inward from the side of the perineum. But to extract a stone of ordinary size we must also make a lateral section both of the prostate gland and of the external parts on one or both sides (medio-lateral and medio-bilateral operations). Now comes the most important question of all. Which of all these operations is the safest, or that attended with the least average mortality? Is it one of the median operations: the medio-lateral, the medio-bilateral, or the medio-vertical; or does the advantage lie with the old lateral operation? The question can only be answered by referring to the recorded results of these different operations. We may put out of the competition the medio-vertical as too restricted in its range. The medio-bilateral was, as I stated in my last letter, in the hands of its author, an unfortunate operation in its results. It only remains, therefore, to compare the medio-lateral and the old lateral operations. With respect to the latter I referred in my last in an especial manner to Sir William Fergusson, in the hope of drawing from him the most recent statistics of the lateral operation, which he seems never weary of extolling to his applauding students as superior to every other. Having failed in my object, I refer to Sir William's published work on Surgery, in which he states that the highest average of success in the hands of Cheselden and other great operators whom he enumerates, has been one death in five, six, seven, or eight. Now in the medio-lateral operation, which I recommend, there is ample evidence to show that the average mortality from all operations, by whomsoever performed, is not more than one in twelve, while in the practised hands of my young friends, Dr. George Macleod, Dr. Eben. Watson, and Dr. George Buchanan, a still higher degree of security has been attained. These are surely recommendations that might induce even a surgeon to a metropolitan hospital to try the operation, although I am aware that it has to contend with the good old English prejudice against everything which comes from the country of John Hunter.—*Lancet, June* 27, 1868, *p.* 831.

68.—ON CYSTITIS AND PROSTATITIS.

By Sir HENRY THOMPSON.

[The chronic form of cystitis is that which most requires our attention, and in treatment most care and judgment. In the simpler, there is little else than some increase of the natural mucus from the bladder mixed with the urine. In the other form the mucus is very tenacious, and acquires a thick viscid character on standing. The most common cause of this is inability of the bladder, either from atony of its coats or from prostatic obstruction, to empty its contents; yet it does by no means necessarily occur in these circumstances.]

With regard to the treatment, the first thing is to take care that the bladder is emptied by a catheter once, twice, or three times a day, in the easiest manner possible, of which I treated in the fourth lecture. And this is necessary because decomposing urine is a great source of irritation to the mucous membrane. The urea contained in the secretion which enters by the ureters in a healthy state is soon decomposed into carbonate of ammonia, and the ammoniacal salt is an acrid and irritating substance. You explain to your patient that his bladder, not having been emptied for many months perhaps, has acquired somewhat the condition which a badly washed utensil would have done in like circumstances—a useful and sufficiently accurate illustration for the lay understanding, and he will appreciate it when he finds, as he probably will, that the mucus diminishes considerably after a few days of this treatment. But suppose it does not do so, or does so but slightly, what then? I will tell you what sometimes happens, and I am not sure that the fact I am about to ask your attention to has been observed or recorded. It is this: *you cannot completely empty every bladder with the catheter.* When the prostate is irregular in shape and throws out protuberances into the bladder, there are sinuses or spaces between them, which retain one, two, or even more drachms of urine. Again, there are not unfrequently numerous small sacculi in the coats of the bladder which act in the same way. When obstruction at the neck has existed some time, the daily straining, although not considerable, necessary to expel the urine produces hypertrophy of the muscular bands which form that coat of the bladder. Now you know hydraulic pressure is equal in every direction, and in course of time the expulsive act gradually forces the mucous lining between the interlacing muscular bands, and little pouches result. In these it is not uncommon for calculi to be secreted, and thus in time encysted calculus is formed. In any case, however, those pouches become receptacles of urine, which becomes stale, and irritating in consequence. Now the mere withdrawal of the urine by catheter by no means empties the reservoir in these circumstances, and enough of noxious fluid is left therein to maintain the unhealthy condition of its lining membrane. What you have to do is, to wash out the bladder at least once a day with a little warm water before you remove the catheter. I am very particular indeed as to the manner of doing this. Washing out the bladder may be a very valuable mode of treatment, or a mere contrivance for seriously irritating that organ, according to the mode in which it is performed. A common mode, indeed that which I always saw employed some years ago, was to attach to the catheter (which was often of silver, and it is unnecessary to repeat my views about that) a large metal syringe, and to throw in with considerable force six or eight ounces of water. I wish you to cherish a wholesome horror of that proceeding; and in no case can it be necessary. A healthy bladder, and much more a tender one, can only be disturbed and pained by such a process. This sensitive organ is only accustomed to be distended gradually by the continued percolation into it of urine from the kidneys. Let your washing-out at least conform in some respect to that process. Never, under any circumstances, throw in more than two ounces; and even this quantity, for efficient washing, is better avoided. Proceed then as follows:—You have a flexible catheter in the bladder; have ready a four-ounce india-rubber bottle with a brass nozzle and stop-cock, the nozzle long and tapering so as to fit a catheter of any size between Nos. 5 and 10, filled with warm water—say at 100° Fahr. Attach the nozzle gently to the catheter, and throw in slowly a fourth of its contents; let that run out, and it will be thick and dirty, no doubt; then inject another fourth, which will be less so; again another, which will return clearer than the preceding; and the fourth portion will probably come away nearly clear. Now these four separate washings, of an ounce each, will have been really more efficient than two washings of four ounces each; and you will, in obedience to my never-failing injunction, have reduced the amount of instrumental irritation to a minimum. Ten to one but the patient will regard your performance as soothing to his feelings. There are other methods of effecting the object, but this is the *principle* I want you to understand; and the mode of carrying it out which I have described is one of the simplest.

What if this washing-out has not accomplished all we wish? We may then, and often with great advantage, try medicated injections. Perhaps the best mild astringent, when the urine is alkaline and depositing phosphates, is the acetate of lead, in the proportion of one grain to four ounces of warm water, not stronger; to be used once a day. After this comes the dilute nitric acid; one or two minims to the ounce of water. Then you may try nitrate of silver in small quantity, certainly not more than one grain to four ounces to begin with, going up to about half a grain, or one grain at most, to the ounce. You may also use, especially where the urine is offensive, carbolic acid; one or two minims to four ounces is quite strong enough. Then there is a soothing injection well worth your remembering —viz., biborate of soda and glycerine. It may be used where there is no great indication for an astringent, or it may be combined with one. The value of this for sore mouth suggested to me its use for an irritable bladder, and experience has confirmed my expectation. Here is my formula: Two ounces of glycerine will hold in solution one ounce of biborate of soda; to this add two ounces of water. Let this be the solution, of which you add two or three teaspoonfuls to four ounces of warm water. I arrange all these solutions for four ounces because the four-ounce india-rubber injecting bottle already described is a convenient and portable instrument.

In circumstances of great pain you may inject anodynes into the bladder if you please; but they are of little value. And you need not be afraid of the quantity; for the mucous membrane of the bladder appears to have no absorbing power, unlike the neighbouring tissue which lines the rectum. And there, indeed, is your place for action, if spasm and pain greatly disturb the patient; a suppository of cocoa-nut butter, containing from half a grain to a grain of morphia, is often of the greatest service. Counter-irritants play a small part among our remedies; perhaps the best and safest is a hot linseed poultice, well sprinkled with strong flour of mustard, above the pubes. I cannot say much for croton oil, nitrate of silver, &c., there. Hot fomentations, in the form of bran bags, hot flannels, &c., alleviate pain materially; so also hot hip-baths and the hot bidet.

Then there is a host of infusions and decoctions reputed to exercise a beneficial influence in cystitis, I will name some of them in what I think to be about the order of their value for the cases one commonly meets with :—Buchu, Triticum repens, Alchimella arvensis, Pareira brava, and Uva ursi. Now, for the doses of these, your conventional tablespoon is a miserably inefficient measure. Of the first, fourth, and fifth give half a pint daily; of the second and third, a pint—that is of their infusions or decoctions, as the case may be.

The underground stem of the Triticum repens, or the common couch grass, was introduced some years ago by myself. Of this I will only say that it maintains its credit, and is undoubtedly very useful in many cases. For use, boil two ounces in one pint of water for a quarter of an hour; the strained liquor to be taken by the patient in four doses in the twenty-four hours. It was a favourite remedy in the old herbals; and it formed the staple medicine against what was called "strangury," which, a few centuries ago, meant everything like pain or difficulty in making water, no matter what the cause; for the art of diagnosis then was in its earliest infancy. The Alchimella arvensis, or "Parsley piert" (derived from "percer la pierre," and not a parsley or umbelliferous plant at all), has proved in my experience an admirable remedy in obscure cases. Use it as an infusion; one ounce to the pint. Besides these there are the resins, which have a certain amount of influence upon the mucous membrane of the bladder—such, for instance, as copaiba, Venice turpentine, &c. You should not, however, give the dose which you would give in gonorrhœa. Five minims of copaiba, three or four times a day in mucilage, often answers well. I may say the same of the oil of cubebs.

One word about alkalies. As a rule, no doubt, alkalies, in neutralising highly-acid urine, help to control chronic cystitis; and I like the liquor potassæ, as well as the bicarbonates, tartrates, and citrates, which appear to have more diuretic action, and to increase the quantity of urine, when you would rather avoid this action and lessen the frequency of micturition. The old combination of liquor potassæ and henbane, affirmed to be a union of incompatibles, nevertheless seems to me about the most valuable form in practice. I have no doubt that it is quite correct that both henbane and belladonna are deprived of their specific activities when mixed with liquor potassæ. Chemically I dare say that is so. But I am perfectly satisfied that this combination materially controls painful and frequent micturition in the complaint we are considering. Hence I have of late gone back to it, and for the reasons stated.

Now as to acids. Remember that these are by no means the complement of alkalies in relation to the urine. Beware of the popular notion that it is possible to produce an acid reaction on urine by giving mineral acids by the mouth. By giving alkalies you can make the urine neutral or alkaline to any extent you please, but you cannot do the converse with these acids. Yet I constantly hear it said, "The patient's urine is very alkaline; had we not better order acids?" My reply is, "By all means; give an ounce or two daily if you like, but it will not change the reaction of the urine." I have given these quantities, greatly diluted, of course, without the slightest effect on alkaline urine. No doubt mineral acids are useful in giving tone, and so do good; but dont prescribe them with the view of acting on the urine. The acids that do act on the urine are benzoic acid and citric acid, but you have to give so much of these that I do not know whether the remedy is not mostly worse than the disease. The benzoic acid, having some balsamic character, may be useful in some cases of chronic cystitis. The best way to give it is in pills, as it is not soluble in water. Three or four grains, with one drop of glycerine, is a good form; and you must give as many as ten or twelve pills a day if you want to do any good. At all events, it is of no use giving less than six; that would be twenty-four grains in the day. Lemon-juice has also an acid influence on the urine, and if it agrees with the stomach may be taken in large quantity. But here is the important fact for you to remember. Surplus of acid in the urine is a constitutional error, and it enters the urinary passages at the kidney. It requires constitutional treatment, of the digestive rather than of the excretory organs, and mere alkaline treatment does but mask the acid, does not cure it. You have to remodel the patient's habits, control his diet, and take care that his liver and bowels act healthily and freely. On the other hand persistent alkali in the urine is, in nineteen cases out of twenty, a *local* formation in the bladder. It requires local treatment, as by catheter and injecting-bottle, and not physic. Now and then you have alkaline urine, milky-looking, with amorphous phosphates, as a constitutional condition; but this is rare as compared with the cases I am now describing.

I shall close this lecture with some brief remarks on acute and chronic prostatitis.

Acute prostatitis occurs in different degrees of severity, and often comes first before the practitioner's notice when it causes retention of urine by obstructing the neck of the bladder. How this emergency is to be met I have described at some length in the fifth lecture. The organ is often considerably swollen and very tender, and the inflammation may give rise to abscess in the substance of the gland, or adjacent to it; and the matter may burst either into the urethra, its most common course, or into the rectum.

Chronic inflammation of the urethra passing through the prostate, and more or less affecting the prostate itself, is a condition less generally known or recognised. Nevertheless it is a common and important affection. We see it frequently, not always, as the result of obstinate gonorrhœa. I have already referred to it as the cause of symptoms resembling, more than any other malady, those of calculus in the bladder when mild in degree. Thus a patient of twenty or thirty years of age tells you that the following symptoms have rather gradually appeared:—under frequency of micturition; pain following the act, and felt in the end of the penis; occasionally a little blood seen with the last few drops of urine, which may be a little cloudy with muco-purulent deposit; a sense of heat and weight in the perineum and rectum; there is, perhaps, also some gleety discharge in the urethra; and all these conditions aggravated by exercise. You see he gives you a complete sketch of the symptoms of calculus; and how are you to distinguish them? By the history and by sounding. Thus, there is no history of the descent of calculus from the kidney, nor of gravel previously passed. But there is the fact of a chronic gonorrhœa resisting, perhaps, months of treatment. And if the patient shows no improvement you must not decline to sound him. You do so, and find nothing, but that the prostatic urethra was very sensitive; and you make him a little worse, perhaps, for a time.

What is to be done? First and foremost, as a rule, abjure all instruments, which, in most cases, can only do mischief. Treat it as you would a chronic inflammation of the ear or eye—*i.e.*, blister an adjacent surface; make a small blister every four or five days on either side of the raphé of the perineum, by applying with a brush the lin. epispast. of the Pharmacopœia, not so freely as to distress him or prevent locomotion, and keep it up for four or six weeks. I have found the best results from this method, combined with a tonic medicine and regimen, and you will find the patient himself gladly exchanging the dull, weary aching in the perineum for the smart of the blister, and cheerfully noticing how the former gradually subsides under the influence of the latter. In exceptional cases, where chronic gleet is a prominent symptom, the application of a solution of nitrate of silver, not more than five or ten grains to the ounce of water, to the prostatic urethra, may be very serviceable.—*Lancet, June* 20, 1868, *p.* 775.

69.—ON HÆMATURIA AND RENAL CALCULUS.

By Sir Henry Thompson, Surgeon to University College Hospital.

[Hæmaturia is the outflow of urine mixed with blood. Thus, bleeding from the penis at other times than at that of micturition is, of course, not hæmaturia. Hæmaturia, then, is a symptom, and it is a matter for diagnosis to determine what it is a symptom of.]

When you see a specimen of urine containing blood, you will, as a matter of course, make a rough mental note of the proportion of blood present, and you will mark the colour. And as you can count on your fingers the ordinary sources of blood, these will pass rapidly in review at the same time. Let us name them as follows :—

1. The kidneys, where it may be from diseased action, more or less temporary, as inflammation ; or from disease more or less persisting, as degeneration of structure ; or from mechanical injury, as from calculus there, or by a strain, or a blow on the back. If the hæmaturia is the result of inflammation, there will be general fever denoting its presence ; if produced by slow organic change, there will be the history of failing health, and probably urine changed in quality otherwise than by the mere admixture of blood. Where blood is in very small quantity, as it will naturally be at times, note the character of the urine proper—whether of low specific gravity, pale, with albumen in greater proportion than blood or pus will account for ; perhaps renal casts may be found ; and look out for dropsies in any degree. In both the preceding forms, if blood is present it will give the smoke tint to the secretion. Perhaps it may be affirmed that such urine, associated with very little if any local pain, is more likely to come from the kidney than elsewhere. In malignant renal tumour blood may be large in quantity at times : the rapidity of growth, and the size attained, are the marked characteristics of the disease. If mechanical injury be the origin of hæmaturia, there will be the history of a blow or strain ; or there may be the signs and symptoms of renal calculus, of which more detail presently.

2. Then, putting aside the ureters, you will remember the bladder as the second source of hemorrhage ; and here it may be due to some acute cystitis, stone, or tumour. The former is obvious enough from muco-pus in the urine, and through other signs ; while the second may well be suspected by the symptoms, and its presence realised by the sound. Here the hemorrhage is usually florid, and in proportion to the patient's movements. But the third condition—namely, that the hemorrhage arises from tumour—is not always so readily to be affirmed. As a

rule, however, blood from such a source is larger in quantity than from stone, and may be associated with less of muco-pus. If the tumour is malignant, it may be felt, and the pain is often severe; if villous, it gives an even pale-red tint for days together to the urine; and in both cases the blood is florid, unless it is long retained in the bladder, when dark sanies, like coffee-grounds, results.

3. In hemorrhage from the prostate, the third principal locality or source, the same thing occurs, if the organ is hypertrophied and the blood is retained; but here the age of the patient, and the ascertained condition of the organ from the bowel, aid the diagnosis. A slight appearance of blood mixed with the last few drops of urine is a not rare occurrence in chronic prostatitis.

4. When bleeding arises from stricture of the urethra, the patient's history and the cause of the bleeding, almost always instrumental, leave no room for doubt. From the use of instruments also in the bladder hemorrhage sometimes arises. Then it is not to be forgotten that occasionally blood is found in the urine as the result of violent diuretics, from purpura, in fevers, and in a hemorrhagic diathesis.

Now for the treatment of hemorrhage. When you have determined that its source is above the bladder—that is, in the kidney or in its pelvis, probably the first and most influential remedial agent is rest in the recumbent position. Whether from a lesion affecting the intimate structure, or from the mechanical irritation of a calculus in any part of the organ, rest is the first and the essential condition. The patient is, moreover, to be maintained in as cool and as tranquil a state as possible.

It is in renal more than in any other form of hæmaturia, perhaps, that direct or internal astringents or styptics are useful. I shall do no more than name those which as most commonly used—namely, gallic and tannic acids; lead and turpentine; equal to them is, I think, the infusion of matico, say in doses of two ounces every two or three hours. The tincture of iron and also sulphuric acid may sometimes be taken with advantage.

It is, however, in cases of severe hemorrhage from the bladder, or more commonly from an enlarged prostate, that active and judicious treatment is necessary. You will be called sometimes to a patient whose bladder is distended with coagulated blood, or who is passing frequently a quantity of fluid in which blood is the predominating element. Usually this has arisen from some injury inflicted by the instrument, although it may also be from tumour of the vesical walls. Here you will keep the patient on his back, and forbid the upright position, or any straining, so far as you can prevent it, in passing water, To this end give opium liberally, to subdue the painful and continued action of the bladder. Apply cold by means of bags of ice to the perineum and above the pubes. Better still, introduce small pieces of ice into the rectum. Do not use an instrument if it is possible to do without it. There is a great dread in some people's minds about the existence of a large coagulum in the bladder. I have even known a bladder to be opened above the pubes by the surgeon for the mere purpose of evacuating a mass of clotted blood. Leave it alone ; it will gradually be dissolved and got rid of by the continued action of the urine ; while if you are in haste to interfere, and are very successful in removing it, you will succeed also most probably in setting up fresh hemorrhage. The bleeding vessels have a far better chance of closing effectually if they are not subjected to mechanical interference. Meanwhile, support the patient's powers by good broths, &c.

But it sometimes happens that hemorrhage occurs in a patient who has long lost all power of passing urine except by catheter. This is a very different position. Here the coagulated mass which fills the bladder must sometimes be removed, or no urine can be brought away. Thus, you introduce a catheter and none appears, for the end of the instrument passes into a mass of coagulum, and nothing can issue. Sometimes sufficient may be removed by attaching to a large silver catheter a six-ounce syringe or a stomach-pump. Clover's lithotrity apparatus has answered remarkably well with me in two or three instances. Let me caution you never to inject styptics into the bladder ; the irritation does more harm than good.

In passing to another subject I beg to call your attention to a glass before you containing some urine of a dark and somewhat unnatural tint. Let us interrogate the case of the patient from whom it came. In obtaining this specimen I took care that he should first pass about an ounce into a separate vessel to clear his urethra—a precaution always absolutely necessary to avoid error, as I have before warned you—and the remainder into this. It is less translucent than average healthy urine is, and has a deeper colour. The hue is not red, but slightly orange, with a dirty brownish tint, commonly and very well distinguished by the word "smoky" That tint denotes blood to an ordinarily practised eye. Why is it not red? Because blood after a certain term of contact with urine loses its red colour and becomes brown ; and you see it in that condition, or according to the quantity, producing any depth of hue from this up to that of London porter. Put it under the microscope, and you will find plenty of blood-corpuscles. We get this broad principle, then, to start with : bleeding from the more distant parts of the urinary system, unless in very large quantity, will almost certainly make the urine brown, while urine which contains red blood has almost certainly issued recently from some source in the bladder, probably at or near its neck, these being the more common sites of vesical hæmaturia.

In the case before us, then, we proceed easily and rapidly to eliminate many of the sources of bleeding by physical exploration, and by the account which he gives of his sensations. He makes a good stream when a fair amount of urine has accumulated in his bladder, but this does not often happen, for he passes it every two hours or less in the day, not so frequently at night; no straining is necessary. Pain in the course of the urethra is experienced during and after micturition; not severe. He is uneasy about the pelvis and loins on taking exercise, and more blood passes afterwards. He is somewhat emaciated, and so presents a good condition for examination by the hand. He is subject to variation in the intensity of the symptoms, having now and then attacks of a few days' duration, in which they are aggravated, and he dates their commencement in an attack which occurred seven years ago. His age is forty-five years. He has never passed gravel. He is much less robust than formerly; his digestion is not good. A full-sized bougie passes easily into the bladder; no stricture; hypertrophy of prostate at his age not possible. On sounding he is manifestly more tender than usual; nothing is felt, nor any deviation from the natural condition by simultaneous examination by the rectum. Palpation of lower part of abdomen shows nothing. Arriving close under the last ribs of left side with one hand, the other pressing firmly on left renal region, he flinches unmistakably; that is the spot, he says, where he feels pain at times and on movement: right side nothing. We examine his urine: sp. gr. 1018, acid, small brownish deposit on standing; under microscope, blood-corpuscles, some pus-corpuscles, epithelium, no crystals, no casts; albumen a little; corresponding with organic matters present.

What is the seat of the lesion in his case? Perhaps the bladder: we found it tender to the sound, and it acts with undue frequency. Yet remember this is by no means evidence of any primary morbid change there, such conditions constantly accompanying diseases affecting primarily the kidneys or the upper part of the ureter. Much more probably the kidney. The manifest local tenderness, the repeated attacks, the impaired health, the history, the absence of all the more common causes of cystitis in any form, point to the left kidney as the seat of mischief. The absence of albumen and of renal casts—a fact of not much weight, although their presence is of the utmost importance—lead us to believe him free from organic changes affecting the renal organs. I conclude that his left kidney is the seat of calculus, although he has never passed one, and has at present no crystalline deposit in his urine—a fact by no means essential to the diagnosis; and that this calculus is the source of the blood and pus found in his urine.

It is sometimes not easy to say what kind of calculus exists in these cases, of which this is a fair type. When any calculous matters have been passed which can be examined, or when the crystalline deposit in the urine is constant, the inference is pretty clear. Add to this that the probability in any case is strong in favour of uric acid, from its known frequency of occurrence—taking large numbers, say at least fifteen to one as compared with oxalate of lime.

For treatment: Alkaline diuretics and diuretic vegetable infusions, before named, for a period of time; attention to the digestive functions and to that of the skin, for the kidneys are probably working too much vicariously for some other function acting lazily; moderation in highly nitrogenised food; mild alcoholic drinks, perhaps in most cases permitting only a light and mild Bordeaux. Of all medicinal remedies, perhaps none are so valuable as mineral waters, especially those which have sulphate of soda largely diluted as the main ingredient. Take Carlsbad as a type. For two well-known remedial agents, which are very popular, each among its class, I am bound to tell you I have very small esteem. In town, it seems to me that every man advises his neighbour, and on every pretext, to drink Vichy water—advice which is cheap, and of which the value in most instances by no means exceeds the cost. In the country, where perhaps the fairer sex more usually dispense similar aid to their suffering neighbours, the prescription is mostly gin-and-water. Of the first, or natural product, which is a strong solution of carbonate of soda, I must say that, if not absolutely injurious, it is at least greatly inferior to potash; and of the second, or artificial one, that it is about as serviceable to the kidneys as a pair of spurs is to a jaded horse—makes him travel for a time, but takes it out of him in the long run. For the paroxysms of severe pain which denote the passage of a renal calculus, it must suffice here to name, hot hip-baths with diluents, and anodynes in liberal quantity.

I shall here, by way of episode, refer to a mode of determining the true characters of a patient's urine, which is of extreme value in some doubtful cases—a mode which has never to my knowledge been recommended or practised, and which I have systematised for myself. I have already told you how essential it is to avoid admixture of urethral products with urine, if you desire to have a pure specimen. It is sometimes quite as essential to avoid its admixture with products of the bladder. And

I defy you to achieve an absolute diagnosis—by which I mean a demonstration, and never be satisfied with less if it be practicable,—in some few cases, without following the method in question. When therefore it is essential to my purpose to obtain an absolutely pure specimen of the renal secretion, I pass a soft gum catheter of medium size into the bladder, the patient standing, draw off all the urine, carefully wash out the viscus by repeated small injections of warm water (before shown to be rather soothing than irritating in their influence) and then permit the urine to pass, as it will do, guttatim, into a test tube or other small glass vessel for purposes of examination. The bladder ceases for a time to be a reservoir; it does not expand, but is contracted round the catheter, and the urine percolates from the ureters direct. You have, indeed, virtually just lengthened the ureters as far as to your glass. And now you have a specimen which, for appreciating albumen, for determining reaction, and for freedom from vesical pus and even blood, and from cell growths of vesical origin, is of the greatest value, and has often furnished me with the only data previously wanting to accomplish an exact diagnosis. Mind never to be satisfied to guess at anything; make, very cautiously if you will, your provisional theories about a doubtful case—indeed, the intellectual faculty will do this constantly, and without reference to the will,—but arrive at no conclusion, take no action, except so far as you are warranted by facts.—*Lancet, Aug.* 22, 1868, *p.* 241.

70.—STRICTURE OF THE URETHRA TREATED BY CAUSTICS.

Under the care of Henry Smith, Esq., at King's College Hospital.

The treatment of stricture at the present day resolves itself into three chief methods, each one having its staunch upholders. There is the gradual dilatation of the contracted passage; sudden dilatation, as practised by Mr. Holt, of the Westminster Hospital; and there is the mode of cure, more particularly advocated by Mr. Wade, by the application of caustic to the face of the stricture, causing, first, abatement of the irritability of the urethra; secondly, "actual absorption" of the thickened tissue; and thirdly, and lastly, direct destruction of the thickened walls of the passage. This author states that he has never noticed any slough come away with the urine after caustic has been applied to the stricture, thus leading one to suppose that the potassa fusa does not destroy the tissue with which it comes in contact; but, as Mr. Henry Smith observes in his work on stricture of the urethra, "there is no reason to doubt that it has some destructive agency upon a stricture, knowing, as we do, its powerful effect upon other tissues; and I think the effect which is produced after a free application to a stricture can hardly be explained upon the principle of absorption alone."

The following cases have all three been treated by the last-mentioned method—*i.e.*, caustic (potassa fusa) was applied—and all three have recovered remarkably well; and there seems to be no tendency to return of the constriction in Case No. 1. However, a sufficient time has not elapsed to allow of a verdict. We shall be glad to report the further progress of the cases.

No doubt caustic cannot be used in every case of bad stricture of the urethra, but it appears to be clearly indicated in those cases where there is a great deal of irritability of the urethra; in those cases where only a small catheter can be passed, owing to the "density or irritability" of the stricture; and in those cases, happily very rarely met with, where a long constriction of the passage exists of so irregular and roughened a character as to preclude all hopes of restoring it without having recourse to perineal section.

Case 1.—James R., aged 32, a labourer, living at Isleworth, was admitted into King's College Hospital, August 28, 1867, suffering from severe stricture of the urethra. The man states that twelve months before he applied at the hospital he fell while conducting a team of horses, and was run over by the cart which they were drawing. The wheels passed over the lower part of his abdomen. After this accident he was placed in bed, and next morning found he was unable to pass his urine. A surgeon was sent for who, by an instrument, drew off his water, and left the catheter three days in the bladder. From this time the man has had much difficulty in making water, and though on several occasions surgeons have attempted to pass an instrument for his relief, all efforts have been unsuccessful to introduce a catheter into his bladder. When admitted into King's College Hospital, Mr. Henry Smith failed in attempting to push through the stricture the smallest-sized catheter. There was much thickening of the urethra in the region of the perineum, and the patient at times complained of great pain, while the urethra was exceedingly irritable. As no instrument could be passed into the bladder, and as the man was in much pain, several leeches were applied to his perineum, and these gave great relief. The swelling subsided to a considerable extent, and he was able to pass his water in a fuller stream.

August 31. More leeches were applied, and relief afforded.

September 6. Similar treatment, accompanied by similar results.

The excessive sensibility of the urethra having been by this time allayed, Mr. Smith, on September 19, passed a bougie armed with a piece of potassa fusa down to, and applied it to the face of the stricture for half a minute.

September 20. Not so much pain, and stream of water slightly increased in volume.

The potassa fusa was applied in a similar manner, at intervals of two days, up to October 1, when Mr. Smith succeeded in introducing a No. 2 catheter through the stricture and into the bladder.

October 7. Catheter No. 3 passed.

12th. Catheter No 5 passed.

The man wished much to leave the hospital, and was made an out patient on October 23, when No. 7 catheter was passed.

The stricture had shown no signs of returning when the man ceased his attendance.

Case 2.—Henry S., aged 40, a stableman, was admitted into the Victoria Ward with stricture of the urethra, April 27, 1868. The man stated that he had gonorrhœa nearly twenty years ago, but that the difficulty in passing his water commenced about seven years since. Instruments had been at various times passed, and two years before applying at King's College he was in another hospital, where he said he underwent the "splitting-up" operation. On admission it was found that he could hardly pass his water at all, in so small a stream did it come. But the urethra was not very irritable, though no catheter could be passed through the stricture.

April 28th. A bougie armed with caustic potash was introduced into the urethra, and pressed for a short space against the face of the stricture. Not much pain was felt by the patient at the time, and none afterwards, except when he passed his water.

May 2. The caustic potash was again applied. No pain was felt but some muco-purulent discharge was caused, which lasted till

May 4, when Mr. H. Smith passed a No. 4 catheter with little trouble. After the introduction of the catheter, a pill of quinine and opium was administered.

May 6. The urethra bled a little after the catheter was passed. No. 6 introduced. Was at this date made an out-patient, as which he has been treated ever since. Now a No. 8 catheter passes easily (June 11).

Case 3.—Thomas R., a lighterman, living at Brentford, was admitted, under Mr. H. Smith, into King's College Hospital on May 7, 1868. The patient stated that he had had much difficulty in passing his water for five years, and that some obstruction in the passage had existed long before. Six months since he had been, he said, an inmate of the Westminster Hospital, and was under the care of Mr. Holt, who performed an operation upon him, and greatly relieved him for a time; but the passage gradually contracted again, and on admission into King's College Hospital he could only pass a few drops of urine after violent straining, while at times he had retention.

May 8. As no instrument could be introduced, the caustic potash was applied in the usual manner to the face of the stricture, and a good deal of pain was complained of, both at the time and afterwards, by the patient, but no bleeding ensued, and tinct. opii ♏xx. given at night made the man quite comfortable.

10th. Potassa fusa again applied. This time there was but little pain accompanying the operation, and none afterwards.

12th. Catheter No. 2 passed without very much difficulty, and without pain.

13th. Catheter No. 4 passed easily.

15th. It was attempted to introduce a No. 5, but the attempt gave so much pain that it was thought advisable to desist, and No. 4 passed readily.

This man has since been attending as an out-patient, and on May 29 No. 7 was introduced, giving no pain. The patient stated that he made water in a "regular good stream"

These three patients were suffering from stricture of so bad a character that no instrument could be passed, and therefore it was deemed advisable to use caustic as an auxiliary to gradual dilatation in the way of cure; but in most instances, without doubt, at least a temporary relief from the affliction can be afforded by the catheter alone And finally, great caution should be employed in the use of caustic, both in its actual application and also in the selection of the class of cases for which it is necessary.—*Medical Times and Gazette, July* 4, 1868, *p.* 3.

71.—CURIOUS CASE IN WHICH INCONTINENCE OF URINE WAS THE FIRST AND ALMOST THE ONLY SYMPTOM OF PROSTATIC RETENTION WITH SECONDARY DISEASE OF THE KIDNEYS.

By Jonathan Hutchinson, Esq.

[The patient was seen by Mr. Hutchinson only a week before his death. He was 54 years of age. He had suffered for six months from involuntary discharges of urine. It would escape as he was walking in the street, and also in large quantities when asleep in bed. He had no other paralytic symptoms. He could void urine when he wished to do so. Three weeks before his death Dr. Peacock saw him, and advised the use of catheters, and by the first instrument passed a large quantity of urine was drawn off. After this an instrument was passed once a day, and Mr. —— ceased to suffer from incontinence, but also ceased to be able to pass urine voluntarily.]

As I was assured that Mr. —— was rapidly failing in strength, we were obliged to give a very unfavourable prognosis, at the same time we could find nothing to account for his condition. The urine was normal, and he had had no suffering in connection with attacks of retention. Paralysis of the bladder was suggested, yet as soon as the catheter entered the viscus, the stream was expelled with great force. That disease of the prostate should destroy life in so insidious a manner, without cystitis, &c., seemed incomprehensible.

Having got weaker and weaker, Mr. —— at length passed into a heavy, sleepy condition, in which, on Oct. 29th, he died. The autopsy cleared up what of mystery had surrounded his symptoms, and confirmed our conjectures. We found both ureters as large as small intestines, the right kidney a mere bag containing half a pint of fluid, but without any remains of renal tissue, the left kidney much enlarged and inflamed, its cortical structure everywhere infiltrated with grey deposit, its pelvis dilated, and its capsule firmly adherent. Scarcely a portion of healthy kidney structure remained. On seeking for the cause of this in the bladder, we found that organ of large size and with thick fasciculated walls. The prostate was moderately enlarged, and projecting from it into the bladder was an almost pedunculated lobe, the size of one's thumb, which stood up in such a manner that it must have formed a close-fitting valve over the entrance to the urethra, whenever the bladder contracted. This lobe presented a smooth surface, and as it overhung backwards, and had a sloping direction forwards, it would cause no difficulty in the introduction of a catheter.

No doubt the whole kidney mischief was secondary to concealed and unsuspected retention, and probably this had been going on for long. When the bladder had filled to a certain point, escape was permitted, and probably this was more easy in some positions than in others, as, for instance, the recumbent. Had the existence of this prostatic valve been recognised at an early period in the case, the real remedy would certainly have been either to use catheters regularly, or to establish a permanent fistula above (through the pubes).

The case is a most important instance in proof that passive and quite painless retention of urine may lead to fatal disease in the kidneys, that disease advancing most insidiously, and revealing itself only by the increasing debility of the patient.

Inasmuch as incontinence of urine is well known to be not unfrequently the first symptom of passive retention, it may be well to ask why was it not suspected in this case at an earlier period, and whilst it was possible to have saved the man's life. In answer to this, and in apology for my friends who had charge of him, I must ask the candid reader to remember that the gentleman was walking or riding every day to his business, that the only thing he complained of was that he frequently wet his bed, or lost his urine whilst walking, and that he always asserted that he could make water without difficulty, and that he passed plenty of it. Nothing was more natural than that such symptoms should be mistaken for those of paralysis rather than of retention.

I have seen many cases more or less similar to this, but none exactly like it—none in which the symptoms were so misleading, and in which death was brought about so insidiously. A few years ago, I was one day called to Hemel Hempstead, to see a gentleman who was reported to have cystitis and incontinence of urine. He could pass no urine voluntarily, but his bed was constantly deluged. I had great difficulty in persuading him that his bladder was full; but having at length got permission to use a catheter, drew off an enormous quantity. In him, however, the atrack had begun with clear symptoms of painful retention. It was only after sixteen hours of retention that incontinence had occurred.—*Clinical Lectures and Reports of the London Hospital*, 1867-8, *p.* 63.

72.—ON ABSCESS OF THE PROSTATE.—TREATMENT BY PUNCTURE PER RECTUM.

By C. F. Maunder, Esq., Surgeon to the London Hospital.

[Abscess of the prostate is not a common affection. The finger introduced into the rectum will determine the nature of a case. The catheter, on introduction, meets with an obstruction at the prostate, but no attempt should be made to carry it on into the bladder.]

The *objective* or *special* symptom is—a swelling of the prostate, tender and elastic, and perhaps softer at one point than elsewhere where the abscess is pointing. The enlargement may be unilateral in great measure. The diagnosis made, the question of treatment arises. If left to itself an abscess of the prostate will sooner or later break either into the rectum or into the urethra or bladder or both, rarely through the perineum. If into the bowel it is well, the pus flows in accordance with gravity and the abscess cavity, under favourable circumstances, rapidly contracts and closes, but if into the urinary passages the abscess cavity is sometimes kept open for a very long time by reason that urine finds its way into it. The discharge of pus is more or less profuse both during and independently of micturition, which latter is frequent and distressing. Occasionally the spontaneous, or accidental rupture by a catheter of a prostatic abscess into the urethra is attended by quick subsidence of the disease. But on the other hand, before this rupture occurs the patient suffers severely locally and there is a great deal of constitutional disturbance sometimes; a large quantity of pus is formed, and while time is allowed for spontaneous rupture the gland is being destroyed and a more or less permanent fistulous communication may be established either with the rectum or urethra or with both. The timely artificial opening of the abscess cuts short the patient's acute suffering and will do much to expedite his perfect recovery.

How is a prostatic abscess to be opened? Whether through the perineum, through the rectum, or by forcible catheterism? Not by catheterism, although complete retention of urine exist, because unhappy results similar to spontaneous rupture into the urethra may follow. Puncture through the perineum is recommended by authors, and will certainly effect the desired object, but in this region important structures must be severed by the knife before the abscess can be reached, and the matter is further from the knife than if it be approached by another method, namely, through the rectum.

In the three instances of prostatic abscess which have come under my care before bursting naturally, I opened them through the rectum for certain reasons—the pus seemed to be near the finger and would flow in accordance with gravity; no important organ could be wounded and no disagreeable after-consequences were anticipated.

The operation is best performed with a bistouri cache, but in the absence of that instrument a long narrow scalpel protected by adhesive plaster to within half an inch of its point will suffice. This is to be introduced per anum upon and along with the left forefinger and the prostate is incised at the desired spot. The knife should now be withdrawn and a pair of dressing-forceps closed be introduced and passed into the abscess, when on separating the handles the blades will open, the wound will be enlarged and the matter will flow. Before incising the prostate the surgeon will ascertain the position of any artery that may be lodged in the wall of the rectum, and will of course avoid wounding it.

Very little after-treatment is necessary beyond rest for a few days; the puncture at once relieving all distressing symptoms. —*Clinical Lectures and Reports of the London Hospital*, 1867-8, *p.* 72.

73.—AN IMPROVED TROCAR AND CANULA FOR PUNCTURING THE BLADDER PER RECTUM.

By John D. Hill, Esq., Surgeon to the Royal Free Hospital.

In surgical practice cases of retention of urine are sometimes met with which require the operation of puncture of the bladder per rectum, and the retention of the canula in the bladder until a catheter can be introduced through the urethra. Having had some experience in this form of treatment, I have directed my attention to a defect in the instrument now used, which in some cases is attended with a chance of local mischief, and in all cases with discomfort to the patient.

This instrument is so constructed that the canula is beveled to a sharp edge on the point of the trocar, for the double purpose of allowing it to slide with the trocar through the coats of the bladder without obstruction, and at the same to spring over the bulb of the trocar by means of a fissure inserted in one or two of its sides. Hence it will be seen that when the trocar is withdrawn, and the bladder emptied, its walls are in actual contact with the sharp edge of the canula. Further, both ends of the canula being always open, the urine trickles away, keeping the patient constantly wet and uncomfortable. To remedy this defect I have lately passed an elastic bougie through the canula, securing it to the outer lip by a piece of tape. Carrying out this principle, Messrs. Weiss and Son have, under my direction, constructed an inner canula, with one end shut and rounded, to project beyond the sharp edge of the outer canula, while the outer end is locked to the lip of the external canula, a small ring being fixed to it as a handle. Thus when the bladder has been relieved by puncture, and the canula secured with tapes, the internal canula is introduced and fixed. By this means the external canula can be retained with perfect safety and comparative comfort, the urine being drawn off as may be required.—*Lancet, May* 16, 1868, *p.* 617.

AFFECTIONS OF THE EYE AND EAR.

74.—ON THE USE OF THE OPHTHALMOSCOPE.

By Jonathan Hutchinson, Esq., Surgeon to the London Hospital.

Some of the simplest applications of optics to the observation of the eye, and the detection of diseased conditions, depend upon the fact, that the transparent structures still reflect some light, and more when diseased than when healthy. Thus:—

Firstly.—We examine the reflecting efficiency of the surface of the cornea, in order to determine its transparency. In cases in which there is no large opacity, but simply a state of general steaminess caused by an uneven surface, it may be difficult to detect it by direct inspection, but if we expose the eye to the light, and look at the image of the window-frame produced, we shall see directly that this image is blurred and indistinct, like that from a greasy mirror.

Secondly.—We use what is called the catoptric test to determine the presence or absence of the lens. This depends upon the fact that the surfaces of the lens reflect images. Dilate the pupil well with atropia. Hold a small taper in front of the pupil in a dark room. You will observe, if the lens be present, three images: an anterior one, bright, distinct, and erect—from the front surface of the cornea; a middle one, inverted, small, fairly distinct—from the concave posterior surface of the lens capsule; a posterior one, erect, indistinct—from the anterior surface of the lens capsule.

Thirdly.—Again, the surfaces of the crystalline lens easily become visible, by the light which they reflect, whenever we can see them obliquely. When the lens is in its normal position it is difficult, unless by oblique illumination, to see its surface; but if it is malplaced, as we sometimes find it, by congenital imperfection, or from injuries, then its surfaces, being oblique, become easily visible. Any one not aware of this fact would at once declare that the malplaced lens was also slightly opaque, and erroneous observations to that effect are to be found in some records of such cases.

In former days the catoptric test used to be much employed to determine the transparency, or otherwise, of the crystalline lens. Now, however, it has been wholly superseded by another discovery, which in its every-day usefulness is second only to that of the ophthamoscope itself. I allude to oblique illumination. To accomplish this is the easiest matter possible, and by its aid any one of the slightest skill can, in almost all cases, determine at a glance the condition of the patient's pupil and of his crystalline lens. The smallest dots of pigment on the capsule, the least possible streaks of an incipient cataract, become by its aid conspicuously definite. We have no longer any need for the curious, but very disappointing, catoptric test (which fails us just when most needed, *i.e.*, in slight cases; for the discovery of cataract, in any stage whatever, is now perfectly easy. For oblique illumination you need only a candle and a convex lens, say a two-inch. The pupil should be dilated with atropia, and the candle having been placed to one side the patient's head, the lens is held so as to receive its light, and concentrate it to a pencil, which is thrown upon the patient's eye. All the superficial parts, *i.e.*, the cornea, the iris, the pupil, and the lens, may thus be brilliantly lighted up. In addition to the illumination, we may also, with another lens, employ magnifying power, and thus inspect the state of things yet more accurately.

Oblique illumination is applicable to all morbid conditions of the cornea, iris, or lens, and to blood-clots in the anterior part of the vitreous or new growths which bulge forwards into the anterior half of the globe. You cannot, however, by its aid, see the fundus of the eye. To do this we must employ another instrument. Here let us ask the important question, Why is an ophthalmoscope necessary? Why can we not, by simply looking into the little round box, one inch deep, which constitutes an eyeball, see what is at its bottom? The answer is, that the eyeball is not simply a box, it is an optical instrument, and it is from its lens spparatus that the difficulty comes. The rays of light received by the eye are brought to a focus in the retina; back again from the retina they are reflected, and pass out of the eye, destined to depict somewhere an image of the retina itself. The lens apparatus, however, not only brings the rays passing in to a certain and definite focus on the retina, but it acts on those which pass back, and brings these also to a focus at a certain and definite place. There is no difficulty whatever in illuminating the fundus, any light held in front of the eye will do that, nor have the structures of the fundus any difficulty in reflecting light by which they themselves ought in turn to become visible. The difficulty is in bringing the eye of the observer into the line of the reflected rays; this without artificial aid is impossible, and hence the necessity for the ophthalmoscope.

I have said that every lens has a principal focus, or spot at which parallel rays which impinge upon it are made to meet by the convergence induced. Now, suppose that from this focus the rays are reflected back again, they must pass through the lens in the reverse direction, and will again become parallel. If, however, divergent rays be used, they will in returning be converged and made to meet at another focus in front of it. Inasmuch as the rays were at first not parallel but divergent, the focus at which, after passing through the lens, they meet, will not be at the same distance as that for parallel rays, but at a greater one. The distance will always be in exact proportion to the degree of divergence, and thus the two foci will always bear mutual relations to each other. If one be brought nearer to the lens the other will be further off and *vice versâ*. Let us call them from this fact, that they maintain mutual relation, "*conjugate foci.*" You may observe, if you like, that although conjugate they keep each other at a distance. It is absolutely necessary that you should observe that all the rays of light passing out from the eye take a direction towards this conjugate focus, and that thus an observer who would make use of them to see the fundus must bring his eye into their line. This line, however, is the same that the rays took in passing into the eye, and if you try to intercept those coming out, you will intercept those going in and cut off the source of illumination.

Thus if we hold a candle two feet in front of the observed eye, its rays, divergent, will be refracted in entering the eye, and will depict an image on the retina—they will then be reflected and again refracted in such a manner that an image of the fundus will be found at the position of the candle flame, that being the position of the conjugate focus. If the observer puts his head in the direction of these rays between the candle and the observed eye, of course he stops the rays which should have entered from the candle, he illuminates only the outside of his own head and the eye of his patient is left in shadow. If he tries to see by looking from beyond the candle, then the flame of the latter intercepts his view and dazzles his eye. What is wanted is some contrivance to enable the observer to bring his head into his own light. Now the mirror of the ophthalmoscope does this, a reflecting surface with a small hole in the middle, it practically makes the observer's eye the source of illumination, and brings it into the direction which the rays of light returning to their conjugate focus must take. Foreshadowed by Cumming, invented by Helmholtz, improved by Coccius, Reute, Liebreich, and many others, this little instrument, which has worked such a revolution in ophthalmic science, is thus simple in its essential principle.

The ophthalmoscope as in daily use, consists of two parts, a mirror and an object lens, and to these is often added an eyepiece as well. The mirror, however, is the essential, the other parts are accessories intended for different special purposes. Without troubling you with details respecting the various modications of the instrument, I will now describe the use of the simplest of them—a reflecting mirror slightly concave, and with a perforation in its centre.

Having placed the patient's head in such a manner that the light (a lamp, candle, or gas-light) is on a level with his temple, and slightly behind it, and his face, as a consequence, in shadow, the observer sits in front and applies the ophthalmoscope mirror to his own eye. He should keep both eyes open that he may see where the light falls, and then move the mirror until the light falls full on the pupil of his patient. In a moment he will perceive the first fact which this instrument reveals, that the fundus is not black, as it has always appeared to be before, but that it is of a brilliant fire-red. He will, however, see nothing of the fundus distinctly, only a general red reflex. Now at this point the student must stop awhile and use his mirror, to inspect first, the transparency of the cornea, and next, that of the lens and vitreous, and to do this he must make the patient move his eye in various directions. After a little practice he will be able to manage his light well, and to throw it with precision wherever he may wish, and to keep it steadily on any given part. At a first lesson he may even, with advantage, practice for awhile where it is rumoured that some end, by illuminating the second button of the patient's waistcoat. Tact in directing the light having been obtained, we may now proceed further. Instruct the patient to look, not full in your face, but over one shoulder; if you are inspecting his *right* eye over your *left* shoulder. You will, when he does this notice at once that the tint of the light reflected from his fundus is changed, that it is no longer fire-red but canary-yellow. The reason of this is that a different part of the fundus is exposed to view, that, namely, of the optic disc itself, which is much lighter in colour than the rest. The area of yellow is very large—occupies, indeed, the whole of the field, while we know that the disc itself is very small. This proves that the objects thus indistinctly seen are immensely magnified. Magnified by what? By the patient's own eye which, as we have said, is equivalent to a lens of one-inch focus.

Hitherto, we have seen nothing distinctly, but if the observer now brings his head very close to his patient's face, he will be able with more or less facility to observe the details at the bottom of the eye, the trunks of vessels of the retina, the optic disc, &c., &c. All these will be seen very large indeed, being still magnified by the patient's eye. What he sees now is equivalent to type looked at through a one-inch lens, placed exactly one inch in front of it.

[It is plain, then, that we cannot see the fundus of the eye without optical aid. Of such aid, we have our choice of the inverted and of the erect. Both are seen much magnified, the latter much more so than the former. For ordinary purposes the inverted image is used. It is seen very easily, and it brings a large field into view at once, so rendering the observer much less liable to inconvenience from slight motions of the patient's head. The examination of the erect image is chiefly useful for the inspection of detail, and even for these it requires great practice.]

Next I will attempt a few suggestions by which beginners, and those who use the instrument but seldom, may best hope to avoid mistakes.

1. Always indulge yourself in the use of atropine, and by its aid both enlarge the patient's pupil and paralyse his accommodation. Experts can manage without, and may sometimes smile at those who are obliged to use it, but the increased facility which it gives is such that no beginner should neglect it. The objection that it causes the patient inconvenience is a very trivial one. What the patient wants before all things is, that a correct opinion should be formed, and to this end he is quite prepared to make a little sacrifice of convenience. For want of the use of atropine I think I have known even experts overlook things which would have been apparent at a glance had it been used.

2. Always proceed on system. Examine the eye first without the object-lens, and ascertain the state of the cornea, lens, and vitreous. No mistake is easier to make, or more frequently made, than by the immediate employment of the inverted image to overlook the fact that the media are not perfectly transparent. With strong illumination you can look right through a slight opacity in the cornea lens or vitreous, and observe only that the retina and choroid are seen indistinctly. Many a diagnosis of "hazy retina" ought to have been "opaque vitreous." It is like criticising the beauty of a prospect, and declaring that it looks dull, when you have forgotten to observe that the window wanted cleaning. If you have any doubt as to the state of the cornea or lens, examine them by oblique illumination before going further. Many opacities in the cornea are so slight that you overlook them on naked-eye inspection, and also with the ophthalmoscope mirror, but find them directly by oblique illumination. Need I add that you must be very particular that your object-lens, when you use it, is quite clean. Any stains on it will be seen as if on the patient's retina.

3. Having completed your examination of the media, still proceed on system. The next duty is to estimate the length of the eyeball. A patient may come complaining that he is rapidly losing his sight, and you may find that it really has become so defective that he cannot read the largest ordinary print. You hastily assume that he must have some disease of the deep parts, some form of amaurosis. You proceed to ophthalmoscopic examination, and again hastily employ both mirror and object-lens, and it is quite possible that you may overlook altogether the fact that the eyeball is much too short and the patient hypermetropic. In high degrees of hypermetropia, if sudden failure of accommodation happen to occur, the defect in sight may often be so great as to draw the attention quite away from the right scent. I have already described the method by which we ascertain whether an eye is abnormal as to length. For the benefit of the mere novice, I may, however, here add, that

whenever without the object-lens, any of the details of the fundus—vessels, disc, patches, &c.,—are easily seen, he may be quite sure that the globe is either too long or too short, or that the lens is wanting. If these objects are seen very easily, and the image very bright and beautiful, then, in all probability, it is an inverted image, and the eye is myopic. If only large trunks of vessels have been seen, and these not easily kept in view, then probably it is the erect image, and the eye hypermetropic.

4. Still proceed on system. Having ascertained that the media are clear, and that the eyeball does not materially deviate from its normal length in either direction, you may now examine in succession the optic disc and its vessels, the retina, and choroid near to it, the yellow spot, and lastly, the outlying districts. I must mention each of these separately.

5. The Optic Disc. Note its shape, its margins, whether definite or otherwise, its colour, and its level. Observe whether the vessels upon it are seen sharply or not, and look particularly as to how they conduct themselves at its margin. Distinguish between artery and vein, and note the size of each. It is a common mistake with young observers to pay attention to the vein only. In the healthy state the disc should be round, and its choroidal rim distinct and sharp; the vessels on its surface should be seen with beautiful clearness, and the difference between vein and artery, as to size and colour, should be readily distinguished. In the centre, or near it, and close to where the trunks of the vessels dip back, there will be seen a bright white patch. This white patch may be large and very conspicuous in some eyes, and small in others, whilst still the eye is not in the least diseased. As regards the vessels, you must distinguish between the large branches of those destined to supply the retina, and the minute ones which give a general pink tint to the nerve itself. The latter may be much diminished, whilst the former retain their size.

Amongst the more common peculiarities displayed by the disc in a state of disease, we have—

1st. The formation of crescents by its side, or of irregular circles around it in myopia.

2nd. A jagged condition of the choroidal rim, indicating either the commencement of crescents, or the previous occurrence of inflammation (neuritis).

3rd. A hazy semi-opaque appearance of the structures in which the retinal vessels run, by which the latter are in part concealed and rendered indistinct. In this state the margins of the choroidal rim are concealed, and the disc appears to be much increased in size, and to be limited by a shaded, indistinct edge. This "woolly" condition implies neuritis.

4th. The disc may be too red or too pale. The pallor sometimes amounts to absolute whiteness, sometimes it is blue-white, and sometimes it is a dirty grey tint. Sometimes the pallor affects the whole disc surface, and at others only a part. If only a part, the third next to the yellow spot is that usually affected, and in commencing cases this is always the first to suffer. The pallor may indicate mere anæmia with, perhaps, primary atrophy, or it may indicate an anæmia and atrophy which are secondary to inflammation. It requires much experience to decide this point.

5th. The disc, instead of being on the same level as the rest of the retina, may be pushed backwards, or cupped as it is called. This cupping will be recognised by carefully tracing the main trunks of vessels and observing whether they curve on passing over the choroidal margin. If the cup is well marked, the vessels will bend so much that they are lost sight of at the edge of the disc, to be found again on its surface, looking much smaller and paler than those in the retina, and requiring a little movement of the object-lens to bring them well out. Cups of this kind imply intra-ocular pressure, the characteristic of the disease known as glaucoma. With them pulsation of the vessels may often be observed.

Having carefully studied the disc, your attention will next be directed to the retina and its vessels. The retina ought to be almost perfectly transparent, but in dark eyes—and particularly in members of the dark races—a delicate haze, or bloom-of-plum appearance, may be observed in it, especially near to the yellow spot. You ought to be able to trace the retinal vessels with the greatest ease. If this cannot be done, then inflammation of some kind or degree is present. The grand characteristic of inflammation, as far as the retina is concerned, is opacity. This opacity may vary from the merest haze to that of a dense white or grey pellicle. By this haze the trunks of the vessels will probably be more or less concealed, but if the deeper layers of the retina are affected, their concealment may not be much. You will remember that the retina consists of three principal layers—that of rods and bulbs, which is close to the choroid, and probably fed by it, that of nerve cells, granular matter, &c., in the middle, and that of nerve-tubes (derived from from the optic), &c., which is innermost. It is in the latter layer only that the arteria and vena centralis run; these vessels have nothing to do with the deeper or outer layers. The inflammation may affect chiefly either the inner or outer layer, being in the one case, a neuro-retinitis, in the other a choroido-retinitis.

In some cases of retinitis, as in that which attends Bright's disease, hemorrhages are very common.

The yellow spot is recognised almost as much by its negative features as by any distinctive peculiarities. It is situate a little to apparent nasal side (inverted image) of the optic disc, and is exactly opposite the observer when the patient looks at the ophthalmoscope mirror. No large vessels cross it. It is more highly pigmented than the neighbouring parts, and also often looks rather hazy and indistinct. It is here that the deposits characteristic of Bright's disease are earliest seen.

The choroid is the tissue which gives colour and glow to the fundus. It may vary exceedingly within the limits of health, and its variations will cause apparent haze, or otherwise, in the retina. Before trusting yourself to any ophthalmoscopic descriptions whatever, examine carefully the differences in the eyes of fair and of dark persons. In the latter you will find the choroidal epithelium full of pigment, and showing dark mapped-out areas, which might easily be supposed to be morbid, whilst the vessels of the choroid are concealed. In the fair-complexioned eye the leashes of vessels will be seen with marvellous brilliancy and beauty, and the suspicion of atrophy will be suggested.

It is much more common to see the results of inflammation in the choroid than to trace the early stages of such. The results are permanent, and very conspicuous. The epithelium may be absorbed in large patches, usually with masses of black pigment remaining. The absorption may implicate deeper layers, and be attended by atrophy of the vascular rete and exposure of the sclerotic. The patchy condition in a case of choroiditis disseminata may be compared to that of a piece of well-marked tortoise-shell.

Inflammation of the choroid in patches is usually of syphilitic origin. Atrophy of the choroid, independent of inflammation, is frequent in advanced states of myopia.

Inspection of the outlying districts of the fundus is easily done, by making the patient look upwards, downwards, &c., strongly. It should never be omitted; for not unfrequently changes may here be discovered which will be the key to the case. It is here that the dots of pigment, characteristic of retinitis pigmentosa, will be first found. Here also, in syphilitic inflammation of limited degree, patches may be sometimes found when there are none in the central parts of the fundus.

Having mentioned some of the chief morbid conditions to be expected, I will now specify some of the errors into which novices with the instrument are likely to fall. Like all other instrumental aids—and the stethoscope is a prominent example—the ophthalmoscope must be expected to lead to many mistakes. It is difficult to use, and requires long experience before the observer can trust his own interpretation of what he has seen. Want of familiarity with the varying conditions which may be met in health, is a main cause of error. Thus a well-pigmented choroid in a dark complexioned person may be easily misapprehended. A very large physiological cup may be taken for "white atrophy," or for a glaucoma cup; a margin of black pigment at the edge of the disc may be attributed to disease; and alterations in size of vessels, which are peculiar to the individual, may be supposed to imply anæmia or congestion. It is possible, also, in a highly pigmented eye, to mistake the yellow spot itself for the remains of a blood clot. As to the common error of fancying the retina hazy when the appearances are due to opacity in one or other of the media, I have, I think, already said enough.

Degrees of vascularity are especially difficult of satisfactory comparison. You will hear one authority assert that the disc or retina is congested, when another will declare that they are quite normal. Let me warn you against the diagnosis of "congested retina." In four out of five of the cases in which the words "hyperæmic retina" are used, they are probably employed in error. Both in the optic disc and in the retina, the size of the vessels may differ widely and be still within the bounds of health. Just as one person may have a florid cheek and red ears, and another pale ones, yet both be in good health, so may the colour of the optic disc and the size of the retinal vessels differ. The conditions of the circulation in the retina are such as to make any condition analogous to erythema of the skin simply impossible. If you find the retina visibly reddened, be sure that it is not simply "congested," but stained by effusions, in fact, inflamed. The individual arteries are too far apart to give any general red colour to the whole. The interpretation of congestion must rest on the enlargement of their trunks only; and this, which is a comparative question, is very difficult to estimate. The old notions as to active congestions preceding inflammation, must be abandoned for the retina, as elsewhere. We now know that cell changes are the essential factors in inflammation, and that it is these that induce vascular changes. I do not by any means deny that the optic disc and retina may in some cases contain too much blood, and yet show no trace of inflammation; but I feel sure that these conditions are far less frequent than they are thought, and I warn the beginner against the fatal facility of explaining amblyopia by discovering congestion.—*Clinical Reports of London Hospital*, 1867-8, *p.* 182.

75.—ON SCLERONIXIS: A CLINICAL LECTURE DELIVERED AT THE UNIVERSITY OF PAVIA.

By Professor A. QUAGLINO, Lombardy.

[These remarks of Professor Quaglino are chiefly valuable as applicable to all such damp situations as he describes at the end of his paper. The thirst after novelty at any price has led us to forget those older operations which form the best inheritance our ancestors have bequeathed to us. It must be remembered that the basis of all the new operations for cataract are extraction and depression, or scleronixis.]

Simple lateral depression with the needle for hard cataracts; simple division, or associated with linear extraction, for cataracts of cheesy or milky consistence, are the operations I prefer.

[The author then gives a table of twenty-eight cases of depression of cataract, twenty-six of which were successful, one only unsuccessful, and one required a secondary operation. Are not these results worthy of comparison with those of extraction?]

I must give my reasons for resorting more frequently to this method than to any other.

I had, for some time past, observed that extractions were too frequently followed by suppuration of the flap. This sometimes commenced by a disintegration of the cicatrix; and, moreover, generally just by the time I had come to regard the success of the operation as certain. Suppurative aquo-capsulitis, prolapse of the iris, distorted pupil, or even a closed one, synechiæ, secondary cataract, and often, atrophy of the eye, were among the sad results of this extraordinary form of suppuration. What astonished me the more was, that I had very rarely observed such an occurrence in my practice at Milan, either in private or at the Fate bene Sorelle Hospital. This recalled to my mind the precepts of my predecessors Scarpa, Flarer, and Panizza, who at this very same clinic operated for cataract almost exclusively by scleronixis, and only exceptionally by extraction.

Being as warm a partisan for extraction as any of the modern ophthalmic surgeons, I with but bad grace resorted to depression—a method which the physiology of the eye seemed to have undoubtedly stamped as inferior to that of extraction.

Nevertheless, after what you have seen of scleronixis, should we be right to disregard this method, and to condemn it to the exile and oblivion a distinguished writer of the present day would insist on?

I am surprised to see brought forward, and there and then extolled to the skies, new operations, which possess far greater disadvantages than the old ones, and which are much more dangerous; thus banishing almost entirely a method much less exposed to such disadvantages, and which can boast of its solid successes.

We are, I believe, too much in the habit of allowing ourselves to be led away by the spirit of innovation, and of too readily accepting the dicta of authorities in place of following in the experimental path which our predecessors have traced out for us.

No doubt, to obtain favourable results from depression, we must attend to certain points, both in the operation itself and in its after-treatment. Before proceeding further, I shall quote a few *à propos* words of Scarpa:—

"Impartial observation and experience," he says, "the great arbitrators of all such matters, appear to have declared themselves in favour of this old operation (depression); for it is easier to do than extraction; it is applicable to all kinds of cataracts, whether hard or soft; the consecutive accidents are less serious and less dangerous than those which follow extraction; and lastly, should the operation, in consequence of some accident, fail, it can be repeated twice or thrice, without danger, on the same eye."

Professor Flarer, my own master, held the same opinion; and, I must say, acted on it successfully.

The most permanent and brilliant results of depression are, we must acknowledge, obtained in the case of cataracts which are either soft or cheesy in consistence, in the fluid ones which occur in middle-aged people, and in those which occur in infancy. In hard, senile cataracts it may be adopted, but more exceptionally.

In every case, the precept of Scarpa must be borne in mind—that is to say, to open out widely the anterior capsule, without which a secondary capsular or membranous cataract may form. To effect this essential step, I depart somewhat from Scarpa's practice. Instead of making the incision of the capsule transversely, with a straight lance-headed needle (I do not employ Scarpa's curved one, which is much less easy to manage), at the same time as the lens is depressed, I prefer making at once two vertical incisions, which cross the capsule at each extremity of its transverse meridian, and then pushing the middle of the capsule together with the lens proper, down into the vitreous by the flat side of the instrument. It is much more easy to lacerate the capsule at this stage of the operation, then it is after the lens proper has been depressed; for then it is almost impossible to make any further incision of the capsule, which yields to the least pressure of the instrument, be it ever so exactly directed. I make the first of my incisions before I have hardly well entered the anterior chamber; the second one on the nasal side I make by bringing the point of the needle towards the nose, penetrating the capsule *de novo* at its transverse meridian. Moving the needle from below upwards, tilting its handle, suffices to open out the vertical parallel incisions. This done, I proceed to the second step. This consists in depressing and sinking the lens, which I plunge into the vitreous humour, below and to the outer side, into a space bounded by the inferior and external recti muscles. In sinking the lens, a third incision is made in the capsule, the lower part of which is depressed, and so wide a breach of continuity is made in the anterior capsule as to render any kind of union of the portions of the capsule impossible, the danger of any secondary cataract being thus removed. By adopting the manœuvre I have just described, I have hardly ever had any secondary cataract.

If the cataract is soft or of a cheesy consistence, it may be broken up with the needle, the nucleus or any large particles sunk in the vitreous, and the rest of the cortex left to become absorbed, or, to hasten the cure, even brought forward into the anterior chamber, and then extracted by a curette through a simple linear incision in the base, and external periphery of the cornea.

If the cataract is hard, of an amber colour, after the capsule has been lacerated in the manner indicated, the lens must be sunken to the side into the vitreous by a pretty quick, but delicate movement of the needle; so that it becomes buried in this humour, without however, coming into contact with the bottom of the chamber, *i.e.*, the inner coats, on which it would act like a foreign body.

This manœuvre is easy when the hyaloid has undergone atrophy, and the vitreous humour is more fluid than natural, but becomes more difficult when the vitreous is of normal consistence, and thus offers greater resistance to pressure and favours the rising up of the cataract to its old place. In the case of membranous or secondary cataracts division may still be practised with a straight needle, and it is well accomplished by the manipulation we have spoken of for lacerating the capsule.

The depression of the entire mass of the crystalline lens is hardly ever obtained. To effect this the zonule of Zinn must be cut through at its upper part, and the crystalline in its capsule must be dislocated downwards before depressing it; but this depression of the entire cataract, without lacerating its capsule, is not the practice we propose, nor is it desirable, inasmuch as its absorption is thus prevented. It thus always occupies the part of a foreign body in the interior of the eye, and ends by leading to atrophy of the globe after a series of more or less neuralgic and inflammatory symptoms on the part of the coats of the eye and of the ciliary nerves. In every case we must try to open up the capsule, so as to expose the substance of the lens to imbibition, to marceration in the aqueous humour, and to absorption.

If we compare the results with those of extraction and its various modifications, that is to say, with suppuration of the corneal flap, suppurative aquo-capsulitis, iritis, prolapse of the iris and its consequences, finally panophthalmitis, we shall see that the results (successes) of scleronixis are perhaps not much below those of extraction; and, for our part, we must acknowledge that they are superior, seeing that absolute loss of the eye hardly ever happens. But to what is this due? I think myself warranted in asserting that it depends entirely upon circumstances local and endemic entirely confined to this city, to this province, as it is to the whole of lower Lombardy, where the irrigation of the soil has been carried to its maximum for the cultivation of rice, and has thus converted the district into one vast swamp, productive of myriads of organised beings, infecting its atmosphere with miasmata and humidity.

To this we must add the bad constitutions of our peasants, enfeebled by miasmata, by the pellagra, by insufficient and bad food, and damp dwellings To these same causes must, I think, be attributed the erysipelas and hospital gangrene, which so frequently follow operations and wounds of the most ordinary and trifling description; and it is for this same reason perhaps that operations for hernia are more dangerous than in other more elevated provinces, and also autoplastic operations so commonly go wrong, and to these same causes which we see in this province of Italy may be attributed the more frequent recurrence of cataract than in other parts, a fact which has afforded me the opportunity of studying the subject on a large scale.

We are now studying an entirely new modification of the operation for cataract, that of Professor von Græfe. The wound of the sclerotic is covered by the conjunctiva, and thus appears to offer a better chance of union. Whether this actually be so or not, is a matter we are at present submitting to experience. —*Ophthalmic Review, Oct.* 1867, *p.* 371.

76.—FURTHER EXPERIENCE ON REMOVAL OF THE LACRYMAL GLAND AS A RADICAL CURE FOR LACRYMAL DISEASE.

By J. Z. Laurence, Esq., Ophthalmic Surgeon to St. Bartholomew's Hospital, Chatham, and to the Ophthalmic Hospital, Southwark.

[Before reading the following article, our readers would do well to refer to Mr. Laurence's previous one on the same subject in *Retrospect*, vol. liv., p. 230. Mr. Laurence states that so far as his knowledge extends, the lacrymal gland has been removed twenty times for the cure of lacrymal disease, and with hardly an exception a permanent cure of the principal symptom—epiphora—has resulted. Moreover, what is very remarkable, this result ensued whether the gland was wholly or only partially removed. A possible explanation of this is, that the excretory ducts being severed, the gland left behind atrophies.]

The first question put to me by all those who have heard of my operations has been: Does the eye continue moist after the operation? It does, completely so. My experience in this point of view is corroborated by that of Mackenzie and of others, who have removed the lacrymal gland on account of tumours of its substance. Thus, Mackenzie states, "the moisture and lubricity of the conjunctiva remain unaffected after extirpation of the lacrymal gland." In Dr. O'Beirne's case, in which the lacrymal gland was removed on account of its enlargement and induration, the patient suffered no inconvenience. Nor did Mr. Dixon's patient, who underwent the operation on account of traumatic obliteration of the canaliculi. These facts appear to show that the moisture of the globe is normally furnished by the Meibomian glands.

What effect has the removal of the lacrymal gland on the *abscess of the lacrymal sac?*

The study of my own cases has shown me that after a varying time the secretion of pus from the mucous membrane of the sac decreases, and finally disappears.

Where this result does not progress favourably and spontaneously, it may be promoted by slitting up the lower canaliculus, in order the more efficiently to apply local remedies to the mucous membrane, either in the form of collyria or injections by Anel's syringe. Vin. opii, or weak solutions of argent. nitrat. (gr. i—iv. ad. ℥j.), I find to answer best, applied once or twice a day, washing out the sac with injected water a few times during the day in the interval of the collyria.

My conception of the mode of origin of the abscess of the lacrymal sac is that the sac, in the first instance, gets distended with tears, which are more or less completely pent up within its walls, according to the more or less complete imperviability of the nasal duct. The mucous membrane thus gets irritated and congested, from its undue tension, and possibly from the circulation in its vessels becoming impeded. The tears themselves probably acquire acrid properties during their undue retention in the sac, from chemical changes which may be aggravated and accelerated by the subsequent admixture of the purulent secretion. This purulent secretion, after a time, reacts as a secondary cause of abscess, both by its adding to the distension of the sac and by its own intrinsic irritating properties—probably augmented, as in the case of the tears, by changes in composition from undue retention. Cystitis from an over-distended bladder, due to some obstruction to the flow of urine—whether this be stricture of the urethra, enlargement of the prostate, or any other cause—appears to me to afford an excellent illustration of the mode of formation of lacrymal abscess. Not that I deny that exceptionally dacryocystitis may arise idiopathically in the same way that cystitis may—for I have seen a few such cases myself. That over distension of the lacrymal sac is the usual cause of its abscess, is indirectly proved by the observation which may be made daily, that watering of the eye from eversion or obstruction of the puncta lacrymalia never causes abscess of the sac. In one case, the watering of the eye ensued from a fibro-plastic tumour compressing the sac, and ceased after I removed the tumour.

After what I have said, I think we should neither feel surprised, nor disappointed, that removal of the lacrymal gland does not cure the lacrymal abscess—which may, and often has, existed, off and on, for years—so soon as we could wish ; that a purulent fluid exudes from the puncta, on firm pressure over the sac, not unfrequently for months after the operation. The removal of the lacrymal gland removes the primary cause of the abscess, but it neither removes the inflammation of the mucous membrane nor its disposition to secrete pus, which, as I have endeavoured to show, acts as a secondary cause for the continuance of the abscess ; this, having become established as an independent condition, may take more or less time to disappear—moreover that this is greatly promoted by the removal of the continuous irritation of the mucous membrane by the pent-up tears, is a fact. I can, from repeated observation, most positively affirm. In three cases [Cases 9, 11, and 19] in which the lacrymal gland was removed, acute abscess of the sac followed the operation, but soon subsided, and, indeed, seemed to expedite the cure of the preceding chronic abscess. In my own two cases the perviability of the nasal duct was remarkably restored after the operation. I do not know how to explain this fact, but it would induce me in other cases to obliterate the sac after removal of the gland, should the abscess not yield to milder measures, such as those which I have previously indicated.

I shall now describe the method of operation which I adopt.

The instruments required are—a long narrow scalpel ; blunt-pointed scissors ; a small, sharp, double hook, such as used to be employed to evert the globe in the old operation for squint ; a pair of bulldog-catch long forceps ; needles and silver wire.

Chloroform is administered to tolerably perfect anæsthesia. The skin immediately below the upper and outer third of the orbital ridge is divided with the scalpel. In this step of the operation the skin may be made tense by drawing it from side to side with the fingers ; but it being very movable at this spot, care must be taken not to draw it up or down, otherwise the incision will fall over the frontal bone, or too far beneath the edge of the orbit, and as the lacrymal gland is in close contact with the roof of the orbit, there may be some difficulty in finding it. After the skin has been divided, the fascia connecting the periosteum of the orbit with the upper edge of the tarsal cartilage is cut through and the orbital cavity is gradually entered by successive cautious strokes with the scalpel. After a sufficient cavity has been made into the orbit, the gland is felt for on the roof of the orbit by the fore or little finger of the left hand. After a little experience, it may be recognised by the touch as a hardish, smooth, round body. In feeling for the gland, care must be taken not to push the finger too forcibly back into the orbit, otherwise the gland may, from its very loose attachment to the periosteum of the orbit, be dislocated from its normal situation and pushed back into the orbital cellular tissue, or left attached to the fascia covering the eyeball, and its discovery and excision be rendered difficult, or as I, in one or two cases, found impossible without making an unwarrantably large opening into the orbit. Should there be any difficulty in feeling the gland, it is better to, at once, divide the external commissure of the lids by an horizontal incision outward, made to meet the outer end of the first incision. A triangular flap will be thus formed with its apex outwards; this flap is then thrown inwards, and the outer and upper angle of the orbit is thus freely exposed, when the gland will be much more readily reached, and may, in such cases, be found more in contact with the outer surface of the eyeball than with the roof of the orbit. Before making either of the above two incisions, I always feel for the pulsation of the temporal artery, so as not to wound it ; and this has never occurred in any of my operations. After I have assured myself of the exact position of the gland, I pass the double hook along the side of the finger of my left hand, as a guide, keeping its points along my finger ; I then half-rotate the handle of the hook, so as to bring the points of the hook towards the gland, which I firmly transfix with these points, draw it forwards and carefully sever it from its connections with the end of the scalpel. After removing what I consider to be the gland, I invariably make a section of it, in order to assure myself that what I have removed is really the gland and not portions of the orbital cellular or fatty tissue. The section of the lacrymal gland is firm, dense, of a tawny colour, and of the usual lobular structure of racemose glands, and with the slightest care cannot be confounded with any other of the orbital tissues. As I have before said, although it is desirable to remove the entire gland, it is by no means a *sine quâ non* for the success of the operation; so that it is wrong unnecessarily to extend the limits of the operation, no good end being thus attainable, but on the contrary, certain untoward consequences may ensue, to which I shall, shortly, more particularly allude. After the gland has been thus removed, pretty sharp hemorrhage generally ensues, an artery of the orbit (probably the lacrymal branch of the ophthalmic) being the main source of the bleeding; but this has in all my cases, without exception, always stopped on the application of a stream of cold water from a sponge. The wound should not be closed till the bleeding has stopped, otherwise shortly after the operation the upper lid may become enormously distended by blood extravasated into its loose cellular tissue—a result which I have in a few of my cases witnessed, when I had closed the wound without sufficiently attending to the above precaution. The wound may be closed by silver wire sutures, and care must be taken to place the parts in accurate apposition, more especially if the external commissure of the lids has been divided in the operation. In this case, the suture which requires the most accurate adjustment, is that which fastens the outer apex of the triangular flap to the skin of the temple. The wound may then be treated on general surgical principles: cold water-dressings, followed by warm ones, and even poultices, should any inflammatory action set up. In by far the greater number of my cases union has taken place by the first intention, and after a few weeks little or no trace presents itself of an operation which at the time of its performance appeared one of considerable severity.

It is now incumbent on me to state certain unwished for results which may follow the operation. In most cases slight conjunctivitis ensues; this, in one case, ran on to inflammation of some of the deeper structures, which however gradually subsided under appropriate treatment, without, however, inflicting any permanent injury to the eye.

But by far the most serious result which may follow the operation is ptosis of the upper eyelid. This was, in almost every case in which I observed it, of purely inflammatory origin and gradually subsided spontaneously. but in a few instances it was apparently due to a partial division of the levator palpebræ. In case 10, I am afraid that, owing to a free use of the knife, I must have divided or bruised some of the muscular nerves; for the ptosis was at first complete, although it subsequently became less, and the lateral movements of the eyeball were so paralysed as to give rise to considerable binocular diplopia. Ever after this case I have been particularly careful not to prolong the orbital incision of the operation either too far inwards or too deeply backwards. Indeed, in two instances in which the difficulty of removing the gland without a dangerous extension of the limits of the operation appeared to me impossible, I considered it a more surgical procedure to close the wound without removing the gland at all. It surely exhibits a very puerile feeling, besides a want of moral courage, to sacrifice the welfare of a patient to one's own false pride. Many years ago I saw a remarkable instance of this in another branch of surgery—a hospital surgeon would not be "foiled" in his attempt to introduce a catheter—within four-and-twenty hours the patient had a shiver, and shortly afterwards died from purulent infection.

I have not, as yet, met with any other untoward effects from the operation than those which I have mentioned.—*Ophthalmic Review, Oct.* 1867, *p.* 361.

77.—EPILATION AS A CURE FOR OPHTHALMIA TARSI.

By JONATHAN HUTCHINSON, Esq., Surgeon to the London Hospital.

Ophthalmia tarsi, or tinea tarsi, consists essentially of a chronic inflammation of the hair-sheaths of the eyelashes, and of their proper glands. In bad cases the inflammation involves adjacent structures, the skin, mucous membrane, &c. The discharge adheres to the roots of the lashes, and forms a crust which prevents remedies from gaining access to the inflamed part. By far the quickest mode of cure is by the careful and complete removal of the hairs. The hairs usually come out with their sheaths adhering, showing that the lining membrane has been loosened by inflammation. In bad cases, two or three removals, at intervals of two weeks between each are necessary. The hairs grow again very quickly, and in about six weeks attain their normal length.—*Clinical Lectures and Reports of the London Hospital*, 1867-8, *p.* 220.

78.—ON SOME OF THE ANOMALOUS EFFECTS OF ATROPINE ON THE EYE.

By GEORGE LAWSON, Esq., Assistant-Surgeon to the Royal Ophthalmic Hospital, Moorfields.

Atropine is chiefly used in ophthalmic practice to procure dilatation of the pupil, and to act as a sedative in various forms of inflammation of the eye. The preparation which is generally prescribed is the sulphate of atropia, this salt being preferred to the alkaloid, on account of its greater solubility, for whereas the sulphate is readily dissolved in distilled water, atropia is soluble in water in the proportion only of 1 in 500 parts.

In an ordinary healthy eye, where the retina possesses its normal sensibility, and the iris acts freely, I have never known atropine fail to dilate the pupil; but as a sedative to the eye, I have, on a few occasions, seen it not only fail, but act as a direct irritant, and in two cases which I have to relate it caused the most acute and troublesome symptoms.

In speaking of the anomalous symptoms produced by atropine, I would state my belief that they are entirely exceptional, and that whilst it is well to be aware that they may possibly arise, yet I do not think they ought to prejudice the surgeon against the use of a drug which, when fitly prescribed, is, in the large majority of cases, most beneficial. That a solution of the sulphate of atropia will occasionally produce irritation has been noticed by several ophthalmic surgeons, and the reason of its acting in this irregular manner has been attributed to the presence of some free acid in the solution. The salt has not been neutral, and the solution has given a slightly acid reaction to litmus paper, and to this has been attributed its irritating effects.

I think myself that the explanation is wrong, and that the free acid theory has but little, if anything, to do with the fact that a solution of atropine will occasionally give rise to very painful and troublesome symptoms. What amount of free acid can there be in the one or two drops which are dropped into the eye from a solution of the sulphate of the strength of gr. j. ad aquæ ℥j.? and yet when thus diluted I have seen it occasion great irritation. We use daily in ophthalmic practice salts which contain much more free acid than the sulphate of atropia, such as the sulphates of zinc and alumina, but I do not remember any instance in which they have caused the peculiar forms of irritation which, in exceptional cases, I have seen spring from atropine. I believe that when atropine acts thus as an irritant, or produces peculiar and distressing symptoms, it is due to some idiosyncrasy on the part of the patient, which renders him intolerant of the alkaloid or of its salts, and, in some cases, of any preparation whatever of belladonna. In one or two patients in whom even a very weak solution of atropine has given pain to the eye, I have found that a solution of the extract of belladonna has been borne without even a feeling of annoyance, whilst in other cases the use of belladonna in any form whatever has seemed to act almost as an irritant poison.

The anomalous symptoms which atropine may produce are—

1st. A sense of smarting and heat in the eye, accompanied by redness and lachrymation. These symptoms may pass off in a few minutes, or they may extend over some hours, or even continue for many days.

2nd. An erysipelatous condition of the eyelids and surrounding integuments, with redness and chemosis of the conjunctiva.

As an illustration of the first class of symptoms I will cite the following case:—For a patient on whom I had ten days previously operated for cataract, I ordered a solution of atropiæ sulph. gr. j. ad aquæ ℥j., to be dropped into the eye twice daily. The drops caused so much pain and redness of the eye that she was obliged to discontinue their use. On another occasion the same patient called at my house to have the eye which had not been operated on examined with the ophthalmoscope. Thinking that the irritation which had previously followed the use of the atropine might have been only an accidental occurrence, and due really to other causes, I dropped again into the eye some of the atropine drops. A little smarting was the immediate result, but the pupil became dilated, and I was able to examine the eye. By the time, however, she had reached home, the pain had much increased, and the eye shortly became acutely inflamed, and continued so for some days. This patient, I afterwards found, was able to use a solution of gr. v. of the extract of belladonna to the ounce of water without the slightest annoyance.

I have frequently seen atropine produce a momentary sense of pain at the time of its being dropped into the eye, accompanied with a flushing up of the conjunctival vessels, but, as a rule, these symptoms have lasted but a short time.

The next case is an example of the second group of symptoms which may be caused by atropine. At the beginning of this year I operated on a gentleman for cataract. The case at first progressed very well; but as there was a little soft lenticular matter in the pupil, I ordered a solution of sulphate of atropia (gr. j. ad aquæ ℥j.), to be dropped into the eye twice a day. Soon after its application the eye became very painful, with the lids swollen, and on the following day there was a distinct erysipelatous blush over the lids, and extending down the face. As I had never seen erysipelas follow the extraction of an opaque lens, or the use of atropine to the eye, I regarded its occurrence as an accidental circumstance; but as the drops gave pain, they were stopped, and a lotion of the extract of belladonna was substituted. The erysipelas, however, increased. spreading over the head and forehead, and down the face. The belladonna lotion was shortly afterwards discontinued, as with the swelling of the lids it was not only useless, but it seemed to give pain. All the severe symptoms now abated, and the patient soon recovered, but with the pupil closed by opaque capsule. About six months afterwards the gentleman called upon me at my house, as I wished to examine the eye previous to performing a needle operation. In order to ascertain how much the pupil would dilate, I dropped into the eye two drops of a solution of atropiæ sulph., gr. ii. ad aquæ ℥j. I had not at that time connected the erysipelas with the use of the belladonna, and was quite unprepared for the symptoms which were to follow. Very shortly after I had put the atropine into his eye, he complained of pain, which steadily increased; and about four hours afterwards the lids began to swell, and a distinct erysipelatous blush showed itself. By the following morning he was unable to open the lids on account of their swollen state, and there was a diffuse form of erysipelas extending from the lids to over the brow and face. As there was now no further application of any form of belladonna, the symptoms having reached a certain height, gradually subsided, and the patient in about a week recovered. In this patient the relationship between the cause and effect was so manifest that there could be no doubt that the erysipelas was solely due to the atropine. Not only was he unable to bear the use of atropia, but a solution of the extract of belladonna evidently kept up the irritation in his first attack of erysipelas.—*Ophthalmic Hospital Reports, April*, 1868, *p.* 119.

79.—CHLORIDE OF ZINC DROPS FOR THE EYE.

By JONATHAN HUTCHINSON, Esq., Surgeon to the London Hospital.

Chloride of zinc appears to me to possess some advantages over other astringents as a remedy for certain forms of ophthalmia. I have used it in solutions of from two to four grains to the ounce, usually the weaker one. It is suited for the same class of cases that we use nitrate of silver or alum for, *i.e.*, the catarrhal or purulent. In one case of very threatening diphtheritic conjunctivitis, in an infant of eight months, it succeeded admirably. It is less painful than nitrate of silver, and the two-grain solution may be used freely for the youngest infants. In the late stages of gonorrhœal and of purulent ophthalmia, after nitrate of silver has produced a partial cure, it is very useful. In typical cases of catarrhal it is not, I think, equal to nitrate of silver. In certain cases of pustular ophthalmia, I have found it suit well where other astringents had done no good.

A good rule in the use of stimulating or astringent eye-drops, is to change the formula occasionally. Often when nitrate of silver will do no more, chloride of zinc will finish the cure, and *vice versa.—Clinical Lectures and Reports of the London Hospital*, 1867-8, *p.* 219.

80.—USE OF SETONS IN THE TREATMENT OF EYE DISEASES.

By JONATHAN HUTCHINSON, Esq., Surgeon to the London Hospital.

I have of late years formed a still higher opinion of the efficacy of setons in the treatment of certain chronic inflammations of the cornea. They were much used formerly by Mr. Scott, and for the last twenty years have had a warm eulogist in Mr. Critchett, from whom indeed I first learnt the rules for their employment.

Chronic ulcerations of the cornea, attended by much intolerance of light, are the cases which require them. I think the degree of intolerance and irritability measures the necessity for their use. In the early stages of corneal ulcers, they are less decidedly useful than in the later ones; but my impression is, that in these they often prevent a case from advancing to a worse stage. They never do harm, and they cause very little pain. I have used them frequently for infants, and for cachectic, "strumous" children. The result usually is that within a week the local irritability ceases, the feverishness abates, the appetite returns, and the strength begins to improve. The seton should consist of two threads of thick silk, and should be put into the temple amongst the hair, so as to leave no exposed scar.

They are more decidedly useful where only one eye is involved that when both suffer. They do no good in syphilitic keratitis, nor in cases which are accompanied by granular lids.—*Clinical Lectures and Reports of the London Hospital*, 1867-8, *p.* 219.

81.—SULPHATE OF SODA AS A MEANS OF REMOVING OPACITIES OF THE CORNEA.

By Dr. HENRY POWER.

[The prospects of the cure of a corneal opacity must depend upon whether the lamellæ of the cornea have to any considerable extent broken down, and their places become occupied by connective tissue. The forms most likely to be benefitted by local stimulant or irritating treatment, are those which are included under the terms nebula and albugo.]

The following cases will afford examples of the effects of treatment of corneal opacities with sulphate of soda:—

Cordelia G., aged 47, applied at St. George's Hospital, in Dec. 1867, for opacity of the cornea, the result of accident ten years previously, which was followed by severe inflammation. The cornea was uniformly so dull, that the position of the pupil could only just be discovered, and she was unable to see any type. No inflammation was present. The use of sulphate of soda was commenced, and continued for two months. At the expiration of this time the cornea had so far cleared that she was able to make out the heading of a newspaper, and by the end of July could discern No. 4½ of Snellen's test types, which is the size of large ordinary print.

Case 2.—E. L., aged —, the son of an Italian carver, suffered in April and May from severe keratitis: as a result a large nebula on the lower part of the cornea was left. In the middle of July, he began the use of the sulphate of soda, which was steadily continued. At the end of August the cornea was almost perfectly clear, only a scarcely appreciable speck remaining, which there is little doubt will ultimately vanish.

Case 3.—The following will show the effect of the sulphate on an ordinary case of nebula left after superficial keratitis. W. T. applied at St. George's on the 23rd of January, 1868, with a nebulous opacity of both cornea, which, though not very intense, was yet sufficient to prevent him from being able to distinguish more than the largest test types, about one inch in height, at one foot. The conjunctiva was slightly inflamed, and there was much intolerance of light. This condition was relieved by the application of a few leeches, washing the eye with alum lotion, and rest in a darkened room. As soon as the inflammatory symptoms had subsided, on the 31st of January, the use of the sulphate of soda was commenced; and on the 14th of February he could distinguish the letters of the fourth size with great facility, and one month later was able to see the 8½ types.

Even in very dense leucomata, steady perseverance in the use of the sulphate effects some improvement, as is indicated by the following case:—A. L., aged 25, has for two years had a leucoma. On the 17th of April she commenced the use of the sulphate, having then only quantitative perception of light. On the 17th of July she stated that she could readily discern different colours, and could even see large objects when in motion. She is still continuing the use of the remedy.

It would be wearisome to the reader to introduce many notes of cases which all resemble the foregoing, and have only one or two salient points. Suffice it to say that the general results have been favourable, and I have only in one or two instances been compelled to discontinue its use on account of inflammation being set up. Experience has shown that in the employment of this salt the quantity that should be introduced at one time into the eye should not exceed one or two grains, and the most convenient mode of application consists in everting the upper lid, and brushing the powder lightly over the surface with a camel-hair pencil. The application may repeated every or every other morning, or twice a week, according to the degree of reaction that follows. The immediate effect is to produce a considerable degree of redness and sharp smarting pain, with lachrymation, lasting for a half an hour or more, and therefore more persistent, though less in degree, than that produced by the vapour of bisulphide of carbon, or the vinum opii. After the continued use of the remedy for some weeks, the opacity is observed to become fainter, and the patient is himself able to feel the improvement by his capability of reading types, the letters of which he was previously quite incapable of deciphering. In some cases when the reaction produced by the introduction of the pure salt is too violent, it may be lowered by adding a little starch, or by the employment of a solution of gr. 5 to ℥iv. I am inclined to think that its action is essentially that of an irritant, and that it exerts little or no solvent action on any of the forms of opacity which may be cured by its application. If a small quantity of the exsiccated and pounded sulphate be placed on the tongue it feels rough, and under the miscroscope it appears in the form of angular fragments of no determinate crystalline form, but of very variable size. On the addition of a drop of water the particles coalesce and form a solid cake, which can be moved from place to place on the slide with the point of a needle, and as the water evaporates long striated prisms appear at the margin. It is easy to conceive that the introduction of such a crystalline powder on the inner surface of the lid produces intense irritation, accompanied by copious lachrymation, and a great temporary increase of vascularity in the conjunctiva. Moreover the salt is very insoluble. I found it difficult to dissolve twenty grains in a drachm and a half of distilled water; and lastly, on soaking for many hours fine sections of leucomatous cornea, which had been preserved in chromic acid, I found no increase in transparency, though the application of glycerine and gum to similar sections rendered them in the same space of time exceedingly clear. It seems to me to act to the full as energetically as solution of bichloride of mercury, and as the vapour of the bisulphide of carbon, whilst it is free from the inconvenience of the fœtid odour of the latter, and the danger attendant upon the use of lotions containing the former.—*Practitioner, Sept.* 1868, *p.* 153.

82.—ON TWO METHODS OF REMOVING FOREIGN BODIES FROM THE EXTERNAL AUDITORY MEATUS.

By A. Gardiner Brown, Esq., Trinity Square, Southwark.

Too great importance can hardly be attached to the proper and successful removal of various foreign bodies from the external auditory meatus, and, seeing the subject touched upon in the impression of this Journal for March 7, I wish to point out two methods of extraction which have been of frequent service to me in cases where the foreign body is either spherical or bean-shaped.

Where the substance to be removed is not too tightly impacted in the meatus, atmospheric pressure (suction) may often advantageously be had recourse to in the following way:—A few inches of French vulcanized rubber tubing, of a size to fit the meatus easily, but not loosely, is cut at one end with a pair of sharp scissors in such a manner as to make it fit the visible surface of the foreign body somewhat neatly when pushed gently against it in the meatus. The end of the tube, before introduction, is moistened, and the direction of any inclination of the seen surface of the foreign body accurately determined, so that the cut end shall be properly applied to it. Suction, for the purpose of extraction, is now to be made use of in one of the following ways:—An assistant is to attach an ordinary ear syringe (the piston being home) to the other or free end of the tube, and make gentle suction by drawing out the piston-rod. Or the mouth may be applied to the tube; suction thus produced is extremely convenient, but not advisable if the presence of the foreign substance have set up any suppurative action or other discharge. Or let the left hand of the operator rest comfortably on the side affected of the patient's head, which must be well supported; gently, but firmly, grasp the rubber tube (nicely applied as before) with the thumb and forefinger of the same hand close up to the meatus; starting from this point, run the corresponding digits of the right hand somewhat rapidly along the tube to near its end, pinching it firmly at the same time to exclude all air. The vacuum thus made will act on the substance to be removed immediately the pressure of the left fingers is discontinued.

The above method requires some practice and nice manipulation in order to insure success. If thought desirable, the vacuum may be produced by connecting a piece of the rubber tubing to a phial by means of a cork pierced with a short glass tube, then removing the air by spirit lamp, as in cupping, or by boiling water. To obviate the tendency which rubber tubing has to collapse under atmospheric pressure, the greater part of the length employed may be substituted by quilled glass tubing, this latter being only tipped with the former.

Where the foreign body is spherical, it may often be successfully removed by a rolling-out plan being attempted in the following way:—Select a curved suture needle with a broad but thin point, and rub this extremity on a steel surface (as the blade of a knife), so as to allow the finger, when passed along the concave surface, to feel a slight "burr" or turning-over of the point. The operator is now armed with a microscopic hook of great relative power, and one which will hardly ever refuse to pass between the wall of the meatus and the obstructing body. This instrument should always be passed at that point of the circumference of the foreign body which presses least on the meatus, this being generally, I believe, either above or below when the form is spherical. The rolling-out process requires the needle to be inserted some five or six times over the object, especially when deeply seated. Care must be taken that the "burr" is well brought over the point of the needle in preparing it, or the repeated introduction will push the substance in further or as far as the traction brings it out.—*Medical Times and Gazette, Aug.* 8, 1868, *p.* 146.

83.—PLAN FOR REMOVAL OF FOREIGN BODIES FROM THE EAR.

By JONATHAN HUTCHINSON, Esq., Surgeon to the London Hospital.

The best way that I know of for removing foreign bodies from the ear, is by the use of a loop of wire. The wire should be flexible. The patient's head being placed on its side, the operator should gently press the loop into the ear, turn it a little, and then withdraw. I have used this method repeatedly during the last ten years, and have never had any difficulty. Several times I have succeeded directly with it, in cases in which other means had been tried without success. One of my colleagues succeeded by it in the removal of a piece of lead, just when, from failure by other means, the attempt was about to be abandoned.

I have a horror of the use of the scoop, so generally employed, because it can only act as a sort of lever, and because I have repeatedly known it do much damage. We have a specimen in the Museum, in which a bean was, by its agency, thrust through the membrana tympani, and produced death by its irritation. The forceps are little better. The plan of syringing is safe, but often tedious and disappointing, and when the foreign body is capable of swelling, it may even do harm.

On behalf of the wire-loop plan, I assert that it is easy, simple, effectual, and free from risk.—*Clinical Lectures and Reports of the London Hospital*, 1867-8, *p.* 221.

DISEASES OF THE SKIN.

84.—ON THE THERAPEUTICS OF CUTANEOUS DISEASE.

By Erasmus Wilson, Esq., F.R.S.

In these diseases there is a cutaneous lesion and very commonly a state of constitutional disorder; hence our remedies must be of two kinds, namely, external, or cutaneous or local; and internal or constitutional. To classify the external or local remedies, we must divide them into alleviatives and stimulants and caustics; while the constitutional remedies are, aperients, alteratives, and tonics. Thus if we have a cutaneous disease before us, we soothe it to remove irritation; we stimulate when the indication is to restore the tone and function of the skin; and we apply our caustics if the intention be to destroy exuberant or morbid growth. Then in the case of constitutional disturbance, whether primary or secondary, we regulate the secretions, we modify nutrition, and we restore the vital power. You may interpose the remark, that the method which we are now propounding is the method in common use for the treatment of every disease of the body. Our answer is, that it is so; and that the error is to suppose that disease of the skin has a special pathology of its own, and a special principle of treatment; the treatment of a cut finger and of an eczema is in reality identical. You will observe that we make no mention of specifics, and simply because there are no such things; arsenic is a neuro-tonic applicable to every disease wherein there is a loss of power of the peripheral nervous plexuses and a consequent disorder of capillary circulation and of cell-nutrition. Sulphur in its special usage is a simple fumigatory, destructive of the life of the humble animalcule which represents the cause of scabies, but effecting no more than a variety of other substances could accomplish: for example, common olive-oil, or the seeds of the stavesacre. Tar, again, is simply a stimulant: while the bichloride of mercury is both a stimulant and a caustic. There cannot be a question that there is a manner of handling our remedies that is worth your study, and is, in fact, the matter that most demands your attention. The master is known not by the mere excellence of his tools, but by his method of using them; and this, in fact, creates the need for clinical instruction.

The theory of medicine—and the word medicine includes surgery and every ramification of the healing art, just as the word physician is the general denomination of the practitioner of the healing art, for nature knows none of the pigmy distinctions of men—the theory of medicine at the present day is, happily, a very rational one ; we no longer talk of humors and humoralism, things of the imagination, mere ideas, and incapable of demonstration, but we refer disease in its aggregate to a *plus* or a *minus* of vital power ; our local diseases are dependent upon diminished vitality of tissues, our general diseases upon a depreciation of the vigour of life. And, bringing this method of reasoning down to the diseases which we are now investigating, it may be shown that all our processes have for their object to remove the causes of depression of the vital power on the one hand, and to restore vital power upon the other. The alleviators remove irritants which by their operation upon the peripheral nervous structures depress and exhaust, while the stimulants are direct tonics. And the same may be said of the internal remedies when judiciously employed ; aperients and emunctories remove elements which by their excess weigh down the beam of life ; they create a waste which instantly becomes the most active impulse of supply ; in a word, they are active agents of renovation ; and then and at the proper moment, we step in with our tonics, our digestive tonics, our blood tonics, and our nerve and tissue tonics.

We say again and we can hardly repeat the saying too frequently, that cutaneous disease is a lowered state of vitality, in fact, a debility ; a debility of tissue or of the part ; and a debility of the entire constitution ; and that the aim of our treatment should be to restore the power of the part, and to restore the tone of the constitution. We express an apparent truth when we say, in a particular case, that the constitution is sound, although a local disease be present ; but such a statement is neither philosophical, nor is it rigorously true ; and it is not true for this reason, that you may add increased vigour even to that which is assumed to besound on the average ; and by the addition of new vigour the local disease will disappear. Therefore, gentlemen, while you should always keep in view, as a paramount duty, the cure of a local disease, you must also endeavour, as a still higher duty, to improve the constitution. There are cases in which you can make no progress with the local disease until the constitution is improved ; and we can hardly realize a case which will not get well spontaneously, if we succeed in elevating the vital power.

The LOCAL REMEDIES applicable to cutaneous disease are : water, in a great variety of forms ; alcohol, powders, soaps, glycerine, oils and fats, acids and alkalies, vesicants, caustics, cantharides, and certain vegetable and mineral substances ; for example : wheaten flour, oatmeal, starch, linseed, poppy, bitter almond, stavesacre, camphor, resin, iodine, tar, carbolic acid, lead, zinc, silver, mercury, and sulphur.

Water, in its several states of cold, tepid, and hot, simple and medicated, possesses a variety of properties and an equally varied range of utility. As an abluent it serves to cleanse and soften the epidermis ; as a lotion it cools ; as a fomentation or poultice it warms ; it relaxes when hot, and braces and invigorates when cold, and may be made the medium of applying medicinal substances to the skin to modify the tissues or facilitate their absorption by the organism, and this either to a part or to the entire surface of the body. When used to the whole surface of the skin, it constitutes a bath, and the bath may be charged with a variety of substances, and so become a medicated bath ; thus we have baths of starch, of oatmeal, of milk, of gelatine, of iodine, of mercury, of sulphur, &c. Hebra invented a permanent warm bath, in which he kept a patient, afflicted with variola, during the whole course of the disease, amounting to several weeks. One of the commonest, and, at the same time, one of the most popular of the uses of water, is the water-dressing and the poultice. These remedies are essentially relaxing in their operation on the skin ; they subdue nervous irritability and muscular contractility, and in this way tend to alleviate the pain and heat of local inflammation. But you will perceive that this state of relaxation may be carried to the extent of producing weakness and debility of tissue, and then the remedy which a few days before was of the greatest utility has gradually merged into a cause of disease. Herein you will see the explanation of a cluster of ecthymatous pustules or small boils rising up around a boil or carbuncle that has been long poulticed; and you will also comprehend an occurrence of frequent experience, namely a kind of permanent eczema, maintained by a water-dressing and oiled silk.

Alcohol we employ as a refrigerant for subduing the heat and burning of local inflammation, and especially in the diluted form to which we give the name of evaporating and cooling lotion ; it is also a stimulant, and by that property controls and diminishes the relaxing effects of lotions in general. As a solvent of certain substances, such as camphor, soap, and bichloride of mercury, it is of much practical usefulness in enabling us to employ remedies which are insoluble in water alone, and would otherwise be inefficient. We sometimes rub down a drachm of alcohol with an ounce of the benzoated ointment of oxide of zinc for the sake of the cooling effect produced by evaporation ; a thin fold of linen dipped in a lotion containing alcohol will reduce the heat and soothe the pruritus of an eczema capitis, a result of no mean consequence in an unreasoning and irritable infant ; the combination of alcohol with soft soap and tar, made known to us by Hebra, is a remedy of great value ; and the spirituous solution of the perchloride of mercury familiar to all as Gowland's lotion, is also an excellent remedy.

Powders are useful to relieve heat and irritability of the skin, and also to absorb moisture; they are cooling and dessiccant, and by combination may be made antipruritic and mildly stimulant. We recognise their value in erysipelas, in the popular application of a layer of wheaten flour by means of the dredger; in the starch-powder and fuller's-earth employed in the excoriations and erythemata of children and also of adults; and in the moderately stimulant properties of the pulvis cinchonæ in erythematous burns and scalds. The principal forms of powder suitable to cutaneous purposes are, starch, the pollen of the lycopodium, zinc, calamine, silicate of magnesia, or French chalk; and silicate of alumina and soda, or talc, &c.; and with these may be mixed other remedies, such as camphor, carbolic acid, and perchloride of mercury. Powder forms the lightest kind of dressing that can be applied to the cutaneous surface; it excludes the atmosphere, maintains a normally dry state of the skin, and is easy of removal. But when these conditions are altered, it may become an irritant; as in cases where exudation is copious, and the powder masses together, or where it cakes and dries up into hard and rigid crusts.

Soap is a detergent and a solvent of the epidermis; it is therefore the means that we commonly have recourse to to remove impurities, such as discharges, crusts, and epidermic and sebaceous concretions and deposits. And it is also a stimulant; and we may remind you that moderate stimulation is equivalent to a corroborant or tonic action; a tonic prescribed for internal use is a stimulant; externally, also, the stimulant is a tonic when properly employed, and soap may be regarded as the natural tonic of the skin. There would be a great mitigation of cutaneous disorders if this truth were accepted generally, and as generally acted upon; for to prejudices against the use of soap may be traced a very considerable number of diseases. Soap is also made available as the vehicle of several other medicinal substances; for example: glycerine, camphor, tar, carbolic acid. petroleum, and sulphur; and the soaps, by these additions, may be soothing and softening to the skin, or stimulant and desiccant, or even irritating. Price's glycerine soap is one of the best of the softening soaps, and the detergent and stimulant principles of soap are well illustrated by the tinctura saponis cum pice of Hebra in its application to the treatment of alphos.

Glycerine, from the property of retaining its moisture and resisting evaporation, is very valuable in a dry and parched state of the skin; for the same reason it is an useful adjunct to lotions: it is also important from its property of holding other substances in suspension or solution, and of assuming a semi-solid, or rather gelatinous form, when a small quantity of starch is added to it, and the mixture subjected to a temperature of 240°. The British Pharmacopœia gives to these compounds the name of glycerina; a more classical term is one proposed by Dr. Frederic Farre, namely, glycyria. We have already mentioned to you the glycerine soap of Price's Company, which contains upwards of 45 per cent., or nearly one-half its weight, of the purest glycerine at present manufactured.

OILS and FATS harmonize with the epidermis and blend with its structure; when smeared on the skin, they form a dressing, which, like a varnish, is almost impermeable; it is to a great degree impermeable from within, and therefore it preserves the natural moisture of the skin; and it is equally impermeable to the atmosphere from without We have been in the habit of comparing a thin stratum of fat with a water-dressing of the lightest and least injurious kind, and we may remind you that it was the chief protection on which the ancients relied for the preservation of their wines. The only word of detraction that can be urged against oil and fat is their tendency to undergo decomposition by exposure to the air, and so to generate the fatty acids which are irritating to the skin; in popular phrase, the fat becomes rancid. But the "vanity of woman," as old Celsus observes, the demand which the fair sex have made from time immemorial upon the inventive genius of man to supply them with the means of improving and securing their beauty, has furnished us with a contrivance to prevent the rancidity of our oils and of our ointments. First used by the French for the perfection of their pomades, gum benjamin was suggested by Alexander Ure to the celebrated house of Jacob Bell for the preservation of their ointments. It was first applied to the oxide of zinc ointment for our purposes, and has since been extended to the lard of which ointments are composed, and equally to oils. The British Pharmacopœia has latterly adopted its use, and we may almost say that no ointment or oil is suitable for application to the skin that has not been previously benzoated. As a maintainer and regulator of the surface temperature of the body, oils and fats possess remarkable virtues and remarkable power; with some of the nations of the world oil is the principal article of costume; and, occasionally, to an undergarment of oil they add a dressing of desiccant powder.

ACIDS and ALKALIES sometimes enter into the composition of our local remedies to relieve irritation and pruritus; sometimes as stimulants; sometimes to prevent the formation of crusts; or as solvents of the surface of the epidermis; and sometimes to remove scales. Distilled vinegar and hydrocyanic acid are both antipruriginous; sulphurous acid and acetic acid are stimulants. A soda-bath is sedative and detergent; sapo mollis or sapo viridis is, by virtue of its alkaline composition, an admirable remedy for the removal of concretions and scales; and ammonia is often a valuable stimulant.

Vesicants are represented by cantharides in various forms—in ethereal and acid solution, and also in solution and suspension in fat. We rarely have occasion to raise a blister; but sometimes, as in chloasmata and melasmata, we are called upon to induce desquamation. And we further make use of cantharides as a means of producing stimulation short of vesication. Vesication may also be produced by ammonia, by creosote, and by the oleum sinapis; but these, like the preceding remedies, we employ only for their stimulant properties.

Caustics are acids or alkalies, or their salts; of the former we have the three mineral acids, nitric, muriatic, and sulphuric, chromic acid, and arsenic; the principal acid salts being the nitrate of silver and mercury, and chloride of zinc. Of these the most important is the nitrate of silver, and next to the nitrate of silver the potassa fusa, either solid or in solution. For certain diseases of the skin, caustics must always be ready to your hand; for example, for lupus, for epithelioma, for angeioma, and for morbid growths; and we will venture to say that you will find none more useful than the caustic potash. Arsenic is sometimes employed as a caustic for cancer; but we believe it to be inferior to potassa fusa and chloride of zinc, and dangerous, from the liability of absorption into the system.

Under one head may be included the VEGETABLE PRODUCTS; wheaten flour, oatmeal, starch, and linseed. Wheaten flour we have already mentioned to you as a remedy for erysipelas. Oatmeal in the form of a thin gruel is a valuable fomentation, tranquillizing and softening. Starch is the principal constituent, the diluent, in fact, of our cooling and desiccating powders; in decoction it is, like gruel, soothing and sedative, whether as a fomentation or a bath; and as a jelly, in its cold state, and enclosed in a muslin bag, it constitutes a valuable poultice. Linseed also is an excellent fomentation when used in decoction, and our best poultice when prepared with the meal.

Other products of the vegetable kingdom are; poppy capsules, bitter almonds, camphor, seeds of the stavesacre, iodine, resin, and tar. A decoction of the capsules of the *poppy* is a valuable sedative fomentation. Emulsion of *bitter almonds*, by virtue of the contained prussic acid, is also a sedative in pruritus. *Camphor*, in powder soothes the pungent heat of erythema, relieves itching, and is a mild stimulant to the skin; and in the form of a spirituous solution, it enters into the composition of our sedative lotions. The seeds of the *stavesacre* are an efficient substitute for sulphur in the treatment of scabies, and may be used either in tincture or in ointment.

Iodine is a discutient, and is employed in the simple state of spirituous solution or tincture, or in the form of iodic salts of potash, sulphur, lead, or mercury. As a tincture it produces stimulation of the skin and desquamation of the epidermis, and by these properties is useful in the removal of discolorations, such as chloasmata and melasmata, and thickenings of the epidermis; for example, callosities and corns. Its combination with sulphur, the iodide of sulphur, is the active ingredient in an ointment, which is the most effectual remedy we possess in the treatment of sycosis.

Resin is the constituent of one of our most valuable ointments, the yellow basilicon, for the treatment of broken boils, carbuncles, and chronic ulcers.

Tar, in its varied forms of pine tar, juniper tar, birch tar, and beech tar, is antipruritic and stimulant. As an antipruritic it is combined with soft soap and alcohol to form a lotion; it is also employed for the same purpose as an ointment in a diluted form; but as a stimulant it may be used in its pure state, or as a more concentrated ointment, and applied with more or less friction. In the same group must be included the so-called mineral tar or coal tar, and the Barbadoes tar; for coal tar can only be regarded as the product of destructive decomposition of wood, and coal tar has of late been adapted to our purposes by incorporation with soap, and also in the compound which goes by the name of liquor carbonis mineralis.

Also intermediate in origin between the vegetable and the mineral kingdom is carbolic or phenic acid, a valuable cutaneous sedative and stimulant. It enters into the composition of a very useful soap; in conjunction with glycerine it forms an antipruritic lotion; and as a lotion, or in combination with ointment, it is the antagonist of pyogenesis. Lately it has been used by Dr. Yates, of Kingston, in Canada, as constituent of an ectrotic ointment in the treatment of variola, and, as he informs us, with remarkable success; and it would seem to be especially valuable wherever a purulent discharge is in process of formation by the skin.

From the mineral kingdom we derive a store of valuable remedies; for example: zinc, lead, silver, mercury, and sulphur.

Zinc as an oxide is a constituent of our best powder and our best ointment; as a carbonate under the name of calamine, it is also used as a powder and an ointment; and as a chloride it constitutes an useful lotion and caustic. The oxide is desiccative, protective, and sedative. The ointment, in its benzoated form, is also protective and sedative; while the chloride, in various degree of dilution, is stimulant, anti-pyogenic, and destructive of lowly vitalized cell structures.

LEAD is sedative in its more useful forms, namely, as an acetate, constituting the saturnine lotion of various degrees of strength; in the state of carbonate, and used as a desiccant powder; and also as a carbonate, and in combination with benzoated lard, constituting an ointment.

SILVER, in combination with nitric acid, and producing a nitrate, is a remedy of considerable importance; applicable in solution in water or nitric ether of every degree of strength, and applicable also in its solid form. According to the manner of its use, it may be a sedative, a stimulant, or an irritant. In an irritable state of the tissues no remedy restores the healthy balance of action and quiets refractory nervous excitement so quickly as a lotion of nitrate of silver. It converts at once the most perverse irritability into a quiescent normal process, and produces the state of calm which is necessary for cure. Hence we find it of service in chronic eczemata, in chronic ulcers, and in local pruritus. The name of Higginbottom, of Nottingham, is associated with its application to erysipelas, apparently on a similar principle; and it is destructive of lowly-vitalized tissues, and thereby assumes the character of a caustic. Hebra advises and uses it in lupus, wherein it not only destroys the crude granulations, but promotes a more healthy nutrition of cell growth. But as a caustic for other than the most trivial purposes, it is in nowise reliable; and for epithelioma and angeioma should never be trusted.

MERCURY supplies us with a host of valuable remedies, of which we may enumerate the subchloride and the perchloride, commonly employed in the form of lotion; and the red oxide, the nitrate, the ammoniated, and the red and green iodide in ointment. The lotion of the subchloride of mercury and lime-water we employ in ulcerating syphilodermata. The perchloride of mercury in solution in emulsion of bitter almonds is the famous Gowland's lotion. The ointment of the red oxide diluted with benzoated lard, in the proportion of one to three, is the best possible remedy for pityriasis, and the ointment of the nitrate and ammoniated mercury excellent discutients of chronic eczema. Active inunctions with the mercurial pomade are useful in some forms of syphiloma; the green iodide of mercury ointment is sometimes applied with advantage in alphos; and the acid nitrate is applicable to lupus.

SULPHUR is presented to us as the immemorial cure of scabies, the parasiticide of the acarus scabiei; and is also of value in the treatment of acne, of gutta rosacea, and sycosis. It exists in solution in the liquor calcis pentesulphidi, or solutio sulphuris cum calce, the remedy employed in Belgium for the "speedy cure," the two-hour cure, of itch. As an ointment, we have the simple unguentum sulphuris of the British Pharmacopœia, which is improved in efficacy by the addition of carbonate of potash, and used for a similar purpose. For acne and gutta rosacea the best-known remedy is the unguentum sulphuris hypochloridi compositum, omitted by the British Pharmacopœia, and for sycosis, the most efficient local application is the unguentum sulphuris iodidi.

THE CONSTITUTIONAL REMEDIES at our command are: antiphlogistics, aperients, alteratives, and tonics. First among antiphlogistics are effervescent salines, which facilitate secretion and allay irritability.

APERIENTS exist in abundant store among the neutral salts, and especially in sulphate of magnesia; in vegetable extracts, such as colocynth, scammony, rhubarb, belladonna, and hyoscyamus; and in the oxides and salts of mercury.

ALTERATIVES are found in sarsaparilla, dulcamara, and tar, in the vegetable kingdom; and among metals, in iodine and mercury.

TONICS also occur in great variety, and with an equal variety of uses; some being *assimilative* tonics, such as vegetable bitters and the mineral acids; some *nutritive* tonics, such as cod-liver oil and phosphoric acid; some *blood* tonics, for example iron; and some *nerve* tonics, such as quinine and arsenic.—*Journal of Cutaneous Medicine, July* 1868, *p.* 118.

85.—ON THE ACTION OF ARSENIC ON THE HUMAN SYSTEM, ESPECIALLY IN REFERENCE TO ITS USE IN DISEASES OF THE SKIN.

By THOMAS HUNT, Esq., Surgeon to the Western Dispensary for Diseases of the Skin.

[To do justice to the subject, arsenic must be considered as a poison and as a medicine, in order that its safety as well as its utility may be appreciated.]

We may divide fatal cases of poisoning by arsenic into three classes, according to the number of hours or days transpiring before the fatal result. The patient may die in five or six hours, or less, after swallowing the poison; or he may survive it one, two, or three days; or he may die after a protracted illness of several days, or even recover at last.

1. In cases in which the patient dies in two, four, or six hours after swallowing the poison, he dies of *paralysis of the heart;* and the symptoms are, excessive prostration of strength, with frequent fainting, and ultimately fatal deliquium. Here the dose of arsenic is generally very large. The medical

attendant, finding his patient pale and pulseless, seldom dreams of arsenical poisoning, but suspects internal hemorrhage. But the *post-mortem* reveals nothing of this kind, and the patient is buried, nobody for a moment suspecting that he has been poisoned: for there is no vomiting, nor diarrhœa, nor even pain in the abdominal organs, and yet the patient may have taken two or three ounces of arsenic. These cases are rare, but they certainly do occur.

2. When the patient survives a poisonous dose of arsenic for one, two, or three days, he dies at length, not of paralysis of the heart, but *of inflammation* of one or more of the abdominal viscera; and here, the dose being smaller, the symptoms are very different. There may be slight faintness in the first instance, but the grievous complaint is pain in the stomach, which soon becomes excruciating. The patient complains that there is a fire burning within him. He retches and vomits constantly, especially after drinking, which can scarcely be avoided from the urgency of the thirst, and the dryness, heat, and intense constriction of the throat. The belly is tense and tender, and sometimes swollen. Hoarseness and difficulty of speech commonly follow. Diarrhœa, or tenesmus, or both, are present. The mouth and lips, and nearly all the mucous and serous membranes of the body, partake of the inflammatory action. After a few hours twitches of the muscles, or convulsions, occur, with tremors and severe cramps in the legs; the pulse is rapid and feeble, the hands and feet livid, the countenance anxious and collapsed, and afterwards clammy sweats, delirium stupor, and coma usher in the fatal event. These are the ordinary symptoms of an ordinary dose of the poison.

3. In cases where the patient survives the dose a much longer time, and yet generally dies at length, the cause of death is to be found, not in the heart, nor in the stomach or bowels, but *in the nervous system.* The symptoms are inflammation in the first instance, but not of a fatal kind; secondly, *coma*, with a peculiar palsy of the arms and legs, as if from lead poisoning; and then, thirdly, symptoms of epilepsy in one case, of tetanus in another, of hysteria in a third, and of mania in a fourth. The patient has generally taken but a very few grains of arsenic in these cases, or he has partly got rid of it by vomiting. He may die at length of tetanus or epilepsy, epilepsy, or he *may* recover. If slow poisoning by arsenic ever occurs, these are its symptoms and course.

Here, then, are three classes of cases of poisoning by arsenic, in which (according to the dose taken, and its solution in the stomach) we have distinctly three different sets of symptoms, and three widely diverse causes of death, as well as three dates, periods, or intervals between the entrance of the poison into the stomach and the fatal result. Thus, we have death occurring within a very few hours, from the failure of the heart's action; death occurring within two or three days, from extensive inflammation; and, lastly, death occurring within two or three, or more weeks, the cause being fatal disturbance of the nervous system.

Every practitioner of medicine should store within his mind a ready impression of these facts, as, at a coroner's inquest or at a trial for murder, the life of an accused person may be at stake, and the judge and jury of necessity place reliance on the medical evidence.

Still, it must be obvious that the foregoing divisions are rather arbitrary than natural, and, though they will be very useful as land-marks, they will not apply to every case; for there often occurs an intermediate case, in which the dose, the symptoms, and the date of the fatal event all prove exceptional. For instance, the victim may suffer severely at one and the same time both from the depressing and irritant effects of the poison; or he may possibly die suddenly without any well-marked symptoms at all.

The result of the whole is, that it is as well to exercise great caution, and to be somewhat reserved in our evidence until a *post-mortem* examination has decided whether arsenic is deposited in the tissues in palpable quantities or not.

In *medicinal* doses the action of arsenic presents quite a new field of inquiry; and happily the subject has been investigated of late with great care and attention, and the results are not only highly interesting and satisfactory, but so unexpected and astonishing that the profession has scarcely yet accepted them as facts. We are speaking now of the physical, not the therapeutical, action of minute doses; and we are speaking of *real* doses, not of hypothetical or homoeopathic doses, commonly called "infinitesimal." We have nothing to say of things which *are not.*

Now let us suppose a patient to take a medicinal dose of the mineral, say five minims of Fowler's solution thrice a day for a week. What should we expect? What *do* we expect? What does the profession expect? What does the patient expect? Just what never occurs—sickness, griping, purging, and other signs of irritation in the digestive tube. For the first week there is very rarely any sensible effect whatever produced. At the end of the second week a slight weakness of the eyes is sometimes complained of, the conjunctiva being a very little inflamed. The effects of the medicine do not accumulate beyond this, and by reducing the dose a little, we shall allow the eyes to recover, often without at all hindering the therapeutic effect. There now soon occurs a sense of warmth in the extremities, and a general feeling of improved health and invigoration. Some patients become plump under such a course, others feel in high spirits, and are conscious of an improved appetite. Many say, after a six months' course, that they "never felt so well in their lives." A few, however (and these are mostly nervous or fanciful subjects), complain of disturbed rest and all manner of queer feelings. This is especially the case where the patient knows he is taking arsenic, and *thinks* he is being poisoned by it. After nine or ten months have elapsed, it is common for the soles of the feet, and much more rarely the palms of the hands, to become a little hard and corny. The epithelial scales are thickened, and sometimes the feet are tender, as after a long walk. In persons of fair complexion we often find at length that those parts of the surface which are protected by the dress assume a sort of unwashed appearance, and a few fine scales may be brushed off (Pityriasis arsenicalis). Very rarely indeed a few red papules appear here and there; but eruptions produced by arsenic are trifling, and by no means worthy of serious notice. This is an honest account of the average effects of arsenic in a proper medicinal dose, an average deduced from a survey of upwards of fifteen thousand cases, recorded not in the memory, but in about twenty large volumes of manuscript, supplied chiefly from dispensary practice, the patients being generally ignorant as to the medicine given them, and the effects to be expected from it. Some of them took the medicine almost continuously for seven years together, and not one with a result to be regretted.

The effects of medicinal doses are therefore most curiously diverse *in kind* as well as degree from the effects of poisonous doses. Poisonous doses are almost always fatal; medicinal doses never. As a poison, arsenic is depressing in the extreme. It may produce paralysis of the heart, nausea, vomiting, stupor, epilepsy; as a medicine it is tonic and invigorating, excites moderately the action of the heart and arteries, quickens the appetite, promotes digestion, often cures intermittents, and has been known to cure epilepsy. As a poison it irritates the bowels, and produces diarrhœa, colic, and dysentery. As a medicine it never excites inflammation, scarcely ever diarrhœa, but has often been observed to restrain the undue action of the bowels; nay, it has been seriously proposed as the best remedy for cholera. Of this, however, the writer has no evidence to offer, nor would he be inclined to make the experiment, for this among other reasons, that a cholera patient would probably die some days before so slow a medicine could act at all.

Such, then, are the physiological effects of arsenic in proper medicinal doses. And these are well known to hundreds of practitioners who use it every day *secretly*, and so far, perhaps, *wisely;* for patients do better under it when they are kept in profound ignorance. There is, however, in the profession a wide-spread prejudice against it, founded certainly not upon experience of its use ; for no man would be afraid of it if he, like the writer, had administered not less than 500 gallons of the arsenical solution in ten years in dispensary practice alone.

But perhaps no individual experience ought to settle such a question as the safety of arsenic as a medicine. Some men are wonderfully lucky. We may, therefore, inquire further And, first, as to the *reason* of the thing. Will analogy teach us nothing ? Let it be noted that the medicinal dose of arsenic is equivalent to about $\frac{1}{24}$ of a grain of arsenious acid. But the smallest dose of this acid which is recorded as having been fatal is two grains, or about fifty times the quantity generally required in medicine. Now, imagine the effects of fifty proper doses of *any other medicine* administered in one dose. Think of 200 grains of calomel, 100 grains of opium, 30 ounces of sulphate of magnesia, 30 drams of magnesia, a dram of extract of colchicum, 50 grains of tartarized antimony, half a gallon of castor oil ! Who would not rather trust his stomach with two grains of arsenic than with any of these unheard of doses of the commonest medicines ? One is really ashamed of putting so simple a proposition before the profession. But if the medicinal dose of a medicine be fifty times less than the poisonous dose, how in the name of common sense can it be unsafe ? What can professional science be worth if we are to humble ourselves to such a bugbear as this ?

But, lastly, let us appeal to established facts. In the year 1848 the President and Council of the British Medical Association (then called the Provincial Association) undertook the task of making extensive inquiries among the members of the Association, who had certain questions presented to them in the Journal, as to their experience in the medicinal use of arsenic. And these questions were reprinted and addressed to many members of the profession unconnected with the Association who were believed to have employed arsenic very largely in medicine. The results of this important inquiry were published in the "Transactions" of the Association (vol. xvi., part 2), and in this "Memoir" is embodied the experience of seventy-five practitioners who had used arsenic largely as a medicine, and whose cases amounted in the aggregate to several thousands. Yet, in their replies to special inquiries, it appeared that not one of these practitioners *had ever found the medicine either fatal or permanently detrimental to health.* We are tempted to ask, where shall be got such an amount of evidence as to the safety of any other medicine?

But there are two questions which remain for discussion:—1. Whether arsenic is not a *cumulative* poison, and dangerous on that account? 2. What if an overdose be administered, medicinally or by mistake; is there no danger then? These questions can be settled by an appeal to facts.

1. Arsenic is *not*, as was once believed, a cumulative medicine. On the contrary, there is no mineral salt so rapidly eliminated as the salts of this metal. In proof of this, MM. Danzer and Flandin found no trace of arsenic in the bodies of animals to which doses of fifteen grains of arsenious acid had been given daily. The bodies were examined *three days* after the last dose. The same result occurred in the *post mortem* examination of a gentleman who had taken arsenic regularly for about a year for the cure of a cutaneous disease. He died of typhoid fever, and had taken arsenic up to within a fortnight of his death. Not a trace could be found in the blood, the liver, or other tissues, which were examined with great care. Neither is it found that the *effects* of medicinal doses accumulate or increase after the first fortnight.

2. As to the consequences of excessive medicinal doses taken by accident or otherwise, these are well marked, but rarely dangerous.

We may now divide cases into five distinct groups.

1. In doses of several drachms or ounces, partially or wholly dissolved, and not rejected by vomiting, we have excessive prostration, frequent and frightful fainting, and death within five (or at most six) hours.

2. In more common cases, where the quantity swallowed and dissolved is perhaps less than a drachm or two, we have heat and burning in the stomach, pain aggravated by pressure, frequent vomiting and violent retching, and inflammation of the whole alimentary canal from the throat to the anus, with diarrhœa, tenesmus, strangury, and irritation of probably all the mucous membranes, then cramps and convulsions, cold sweats, and death in twenty-four hours.

3. When the poisonous dose is very small (from two grains to to ten), we have, *first* symptoms of inflammation of a less severe character, and *secondly*, coma, palsy, epileptic or tetanic symptoms, with or without mania; death occurring after a long protracted struggle of several days, from which now and then a patient has been known to recover.

4. In doses from one-eighth to one-third of a grain, or more, we have quite a different set of symptoms, viz., conjunctivitis, dimness of sight, vesication of palms and soles, darting pains in the head, swelling and inflammation of the

joints, pityriasis or lichen, giddiness, nervous agitation or trembling, sleepless nights, sometimes slight gastric irritation or diarrhœa ; or, in the larger dose, vomiting. And these symptoms increase in severity in proportion as the course of poison is protracted, but rapidly disappear when the course is terminated. Some or all of these symptoms will be prominent in slow poisoning.

5. In medicinal doses (from gr. $\frac{1}{20}$ to gr. $\frac{1}{40}$) we observe the effects to be never fatal, but generally tonic and invigorating, the extremities become warm, the appetite and the process of digestion quickened, and the patient becomes more active, and sometimes restless at night. A slight horizontal streak of subacute inflammation of that portion of the conjunctiva which lines the lower eyelid betokens the dose to be sufficient for all therapeutical purposes ; and this dose may be continued, if needful, for several months or years without the slightest detriment to health, and the course may be as safely arrested at any time.

[In the following paper the use of arsenic simply in cutaneous disease is considered. To this question there is a positive and a negative view.]

Arsenic is *not* useful, *first*, in *syphilitic* diseases of the skin ; secondly, in *ephemeral* and *exanthematous* diseases ; thirdly, in *scabies*.

1. In syphilitic diseases. Certain authors have eulogised arsenic in syphilitic eruptions. We propose to show that this is a mistake. Arsenic is perfectly useless in syphilis, and in every stage of that disease. How, then, comes it that authors of repute have held and published a contrary opinion ? Simple thus : a patient presents himself for treatment, with a scaly eruption, which may possibly assume a copper colour. The patient confesses to a primary sore, to an eruption of maculæ, perhaps to a sore throat, and other symptoms of secondary or "tertiary" syphilis. Arsenic is administered, and lo ! the scaly eruption magically disappears, and the case is noted as syphilis cured by arsenic. But, unluckily, there is still a tubercular eruption which does *not* yield to the treatment. The patient is questioned, and he tells you that the *scaly* disease had existed from childhood, years before he contracted the primary syphilitic sore, and now it becomes clear that the arsenic has cured the idiopathic lepra, and the syphilitic eruption has remained in statu quo. Such cases are very common.

2. In ephemeral and exanthematous diseases arsenic is not required, nor, perhaps, is it ever useful.

In the ephemeral class, including lichen urticatus, lichen tropicus, or eczema solare (both common in this hot weather), including erythema evanidum, herpes in its various forms, especially herpes zoster, arsenic is useless. Neither is it useful in the eruptions produced by specific poisons—lichen sulphuris, lichen picis, lichen copaibæ, arsenicalis, or cubebæ; nor, in short, in any eruption which can be traced to either a local or a specific cause. Neither is it useful or necessary in those forms of prurigo which arise from ascarides, uterine irritation, or other obvious and removable causes. Nor is it useful in the exanthemata, or in other acute or ephemeral affections of the skin. In scabies it is also useless, though it has been known to do good in the lichen produced by the excessive use of sulphur.

With these important exceptions, we venture to assert that arsenic is not only useful, but essential, and almost unexceptionably successful, when properly administered, in all cases of chronic idiopathic affection of the skin, including lichen simplex, lichen agrius, prurigo, chronic erythema, impetigo, porrigo, alopecia, ecthyma, rupia, lepra, psoriasis, pityriasis, ichthyosis, eczema, verruca, acne, sycosis, lupus exedens, nævus araneus, ringworm, phtheiriasis, &c., &c., provided always and in all cases, that it be administered discreetly, perseveringly, and with such adjuncts—purgatives, alteratives, tonics, or eliminants—as the case may require. And we may add that it is especially useful in those cases of skin disease which depend on uterine irritation or irregularities. If we are asked to explain the modus operandi of arsenic in all this variety of skin disease, we may as well confess ourselves, after long experience, unprovided with an answer. Shall we say that arsenic has a specific action on the skin and its appendages? Its action on the hair-follicles would seem to confirm this idea. Again, its acknowledged power over intermittents, in each attack of which remarkable class of diseases the skin is primarily affected, would seem to corroborate the theory. But above and beyond this, arsenic is the most powerful of all tonics, curing ague often where quinine has failed, and often curing neuralgia when everything else has failed; and this tonic power over chronic disease may partly explain its influence over chronic cutaneous disease.

But here a question arises,—Are not chronic skin diseases certain forms or symptoms of blood disease? And may not a certain supply of arsenic to the blood chemically correct its morbid condition? These are questions well worthy of experimental inquiry, and we throw them out as problems which should attract the attention of our devoted physiologists and chemists, whose delight is to spare no pains in researches such as these.

So much for the diseases in which arsenic may be expected to be useful. But there are certain *conditions of health* which greatly modify the indication presented by the *nominal* disease.

For arsenic is not a specific for certain forms of skin disease, in the same sense as sulphur for scabies. The very diseases which are generally most ready to yield to arsenic, such, for instance, as lepra, psoriasis, and eczema, may, and frequently do, present themselves under conditions of health which forbid the administration of arsenic. What are these conditions? The question is important; for if *they* be overlooked, there is no prospect of success. They are chiefly of three kinds: organic visceral disease, acute cutaneous inflammation, and a highly irritable state of the nervous system. In all these conditions the use of arsenic is generally objectionable, and unless the health of the patient can be restored to a normal condition, arsenic can accomplish no good, and it may do harm. In addition to these, there are several forms of disease, mild and harmless in their nature, perhaps, but which, nevertheless, counter-indicate the use of arsenic. These are nearly all of them disorders of function or impaired secretion, or imperfect nutrition. They may be comprehended under one word—cachexia.

It is not the purpose of this paper to show how these deviations from health are to be treated, in order that the system may be reduced to a condition favourable to the exhibition of arsenic. We assume that organic visceral disease will not be overlooked, that no practitioner will think of administering arsenic in tubercular lung disease, nor in any other organic lesion, nor in acute affections of the skin requiring depletion and low diet, nor in such a highly irritable condition of the nervous system as would forbid the use of any mineral poison, nor, lastly, in a state of the system in which there is impaired, deficient, or excessive secretion, imperfect nutrition, or a marked deficiency of balance between the powers or actions of different organs. These must all be corrected by well-known appropriate treatment before arsenic can be depended upon as an agent in the cure of cutaneous disease.—*Journal of Cutaneous Medicine, July and October* 1868, *pp.* 144, 249.

86.—ON ANIMAL-PARASITE DISEASES OF THE SKIN.

By Dr. Balmanno Squire, F.L.S., Surgeon to the West London Dispensary for Diseases of the Skin.

It may appear surprising that so mysterious, so severe, and so obstinate a disease as prurigo, should nevertheless so long have remained a mystery, and this may seem a reasonable cause for mistrusting our conclusions; but a consideration of the habits of the pediculus will, we think, sufficiently account for the fact of the constant presence of this parasite in cases of prurigo having been generally overlooked even for so long.

On stripping a person affected with prurigo, it would scarcely occur to any one who was unacquainted with the fact that the disease was produced by a pediculus. The pediculi are rarely numerous enough to arrest the eye, and, more than this, even a careful scrutiny of the skin, including in the survey the parts of it that are the most affected with eruption, will in the majority of cases fail to detect the presence of a parasite—not even a *nit* is to be seen on any part of the skin or on any of the hairs growing from it. Now the head-louse (pediculus capitis) and the crab-louse (pediculus pubis), in cases where the insect itself is not readily to be found, may always be readily detected by means of the nits attached to the hair of the part they inhabit. It is scarcely to be wondered at, then, that the part played by the pediculus corporis should have been so often overlooked. The parasite dwells not on the skin, but on the underclothing. It is on the inner surface of the undermost article of clothing, whatever it may be, that the parasite is to be sought for, and here it is not always very easy of discovery. As already stated, the pediculi are rarely to be found in numbers; and a very few of them are capable of causing very severe irritation. A careful investigation of the patient's shirt may lead to no result, and yet his disease may be due solely to the pediculus. As we have already remarked, the parasite nestles between the "gathers" or "pleats" of the shirt, or between the folds into which about the waist the shirt is compressed by the waistband. The nits of the pediculus are also to be found in the same situations, but occasionally a large cluster of them is to be found at some other part of the shirt.

It should here be explained that the three varieties of louse that infest the human skin vary considerably in their habits. Thus, the pediculus capitis, or head-louse, although it feeds on the skin, dwells on the hair of the head, and also deposits its eggs on the hair—the pediculus corporis, as we have seen, also feeds on the skin, but it dwells on the underclothing, and, deposits its eggs on the underclothing—the pediculis pubis likewise feeds on the skin; unlike the other two varieties, it also *dwells* on the skin, but it deposits its eggs, as the pediculus capitis does, on the hair. It is because the body-louse dwells on the underclothing, and also deposits its eggs on the underclothing, that prurigo is so obstinate a disease. Even when, for the sake of cleanliness, efforts are made to destroy the pediculi which are "generated" by it, the means are generally limited to applications made to the patient's skin, and are therefore futile.

Many practitioners acquainted with our views as to the nature of prurigo have said, "Well, if the disease be due to the cause you attribute it to, I suppose a warm bath ought to cure it."

A warm bath, however, has not even the slightest influence in abating the disease, and the reason of this is that the moment the patient resumes his clothes the process of hatching the ova that are sprinkled over the inner surface of his shirt recommences, and he becomes speedily as bad as ever. On this being pointed out to advocates of the warm bath, they have generally modified their proposal by suggesting that while the patient went into the warm bath his clothes should go to the wash, and that after his bath he should put on clean linen. This is a very simple way of dealing with the thing, but unfortunately it is not so easily to be disposed of.

It is well known that the lowest forms of animal life are, speaking generally, much more tenacious of existence than their superiors in the zoological scale. It will not, therefore, appear extraordinary if we assert that the process linen undergoes in "the wash" does not suffice to destroy efficiently the ova of pediculi attached to the linen ; but, whether this may seem likely or not, we have ascertained that the going to the wash does not disinfect the linen. The patient, whatever means may be taken to destroy the pediculi, has thus a constant supply of the disease (so as to speak) stored up his wardrobe. Every time he puts on a clean shirt, he puts on, if one may say so, a fresh supply of prurigo—that is to say, he clothes himself in linen studded with ova which only require the genial warmth of his body to mature them into the parasites on the presence of which prurigo depends.

The only way to destroy the ova in the clothes is to bake them, and this unfortunately, with the class amongst which prurigo is most common, is not an easy thing to arrange, since the poor, when affected with prurigo, are invariably treated as out-patients. If, however, there be practical difficulties in the way of radically curing prurigo by the adoption of means that would suffice to cure cases of many years' standing in the short space of half an hour, we may at least seek for the most manageable palliatives.

A due appreciation of the tenacity of life displayed by the pediculus, of the nature of the substances which are really calculated to destroy him, and of the rapidity with which lotions applied to the surface of the body evaporate and disappear, to say nothing of the difficulty of efficiently applying them to the skin, which being always rather greasy causes them to run off it like rain from a duck's back—these considerations will explain how it is that the "local applications" which "have been praised" are, as Sir Thomas Watson says, "in most cases used in vain." He mentions vinegar, lime-water, decoctions of dulcamara, lotions composed of prussic acid in an emulsion of bitter almonds, a dilute solution of creasote, decoctions of stavesacre and digitalis ; continuing this list, he mentions ointments containing mercury, tar ointment, and "a hundred others ;" he then tells us how, in a case which had withstood other treatment, he succeeded by the use of aconitine ointment, and how Mr. Gabb had found a weak dilution of the liquor sodæ chlorinatæ very serviceable.

Now, by the above list, which may be taken as comprising all the local applications most in favour for the treatment of prurigo, it will be found that lotions are more in fashion than ointments, and this circumstance accounts to us for the general condemnation with which Sir Thomas visits the whole batch. Amongst the lotions is mentioned a decoction of stavesacre. Now, we have found stavesacre a most valuable external application in cases of prurigo, but we nevertheless endorse the opinion that the decoction is a most worthless preparation for the purpose. This we shall explain further on. But Sir Thomas also condemns "ointments containing mercury." Now, if we were to agree with him in this, we must needs give up all that we have advanced, for everybody knows how justly mercurial ointment (in the shape of white precipitate ointment) is prized by poor mothers as a sovereign remedy against vermin in their children's heads, and every one knows, too, how speedily mercurial ointment will exterminate crab-lice. However, Sir Thomas modifies his censure, in so far as it refers to mercurial ointment, by the following remarkable note, which it is important to our argument to quote, and which runs thus :—

"Since the republication of these lectures in America, I have been favoured by Dr. Bowling, of Adairville, in Kentucky, with an account of a plan of treatment which he has found eminently successful against this distressing malady, and which ought, therefore, to be made generally known. I extract that portion of Dr. Bowling's obliging letter which relates to this subject :—

"'I have, in the last fifteen years, prescribed for a great number of cases of prurigo senilis, and I can say, with a most rigid adherence to truth, that I have not failed in a single instance to effect a permanent cure. I direct that the affected be sponged for a minute or so with good apple vinegar, and then be allowed to dry. After this they are to be smeared over with the citrine ointment (unguentum hydrargyri nitratis). The applications are to be made twice a day. The cure is usually effected in a week. I have never known the constitutional effects of the mercury to be developed in this treatment, save in a single instance, and then but very slightly.'"

Although we are unable to appreciate the use of Dr. Bowling's apple vinegar, we cordially agree with him in his statement that the application of dilute mercurial ointment is one of the very best remedies in cases of prurigo, and that the *smearing* over of even the greater part of the surface of the body with such an application as citrine ointment is not apt to cause, even after a prolonged use of the remedy, any of the constitutional effects of mercury.

We can understand, too, Sir Thomas Watson's success in the treatment of prurigo with "an ointment containing a small quantity of aconitine," although we believe the aconitine had little to do with the cure. The fact is that greasy substances of any kind are more or less efficient remedies in cases of prurigo, and this for the same reason that olive oil or lard, *per se*, is a cure for the itch. The pediculus, like the acarus, breathes through spiracles or little apertures in its exoskeleton, which communicate with its respiratory apparatus. These minute orifices getting clogged by the grease or oil, the insect is speedily asphyxiated.

We have said that, although decoction of stavesacre is useless, stavesacre itself is an efficient remedy. The powder of the stavesacre seeds has long been employed for the destruction of head-lice, and an ointment of the powder has been long known as a very excellent remedy for scabies.

We made trial of the ointment sometime since in a large number of cases of prurigo, and found it decidedly more efficacious than lard used alone. But the ointment, being anything but an "elegant preparation," owing to the coarseness of the stavesacre powder with which it was prepared, we made inquiry as to whether the powder could not be ground finer, and found that, owing to the large quantity of oily matter contained in it, it was impossible to reduce it to anything finer than a coarse meal (for the same reason linseed when ground becomes linseed-*meal*). We accordingly had the oil removed from a small quantity of the meal by percolation with ether, and found that the meal was then capable of being reduced into a fine powder. We employed this powder in several cases of prurigo, and found it quite inert. On inquiring what proportion of oil had been extracted from the meal, we found that it amounted to as much as one half (by weight) of the meal. On making trial of this oil suitably diluted with olive oil, we found it a much more efficient remedy in cases of prurigo than either olive oil or lard, and even more efficient than mercurial ointment. It was plain from these experiments that the efficacy of the stavesacre depended on its oily constituent, and this accounts for the impotence of a *decoction* of the seeds.

As to the internal remedies for prurigo, "sarsapa illa, alkalis, arsenic, iodide of potassium, opium," they are utterly useless if the cure of the disease be the object aimed at. The arsenic and iodide of potassium may operate, perhaps, in a trivial degree; since at all events they are taken up into the circulation, are noxious to insect life, and in a very diluted form must reach the pediculi, which, as we know, feed upon the blood. Moreover, arsenic, after its administration has been continued for a long time, gets deposited in small quantities in a metallic state in the tissue of the skin ; but the effect of these substances must be very inappreciable, unless they be taken in such quantities as to impair seriously the health of the patient. Opium, it is true, may relieve the distress of prurigo by deadening the sensibility of the patient to the irritation of his skin, but it was never pretended that, for this disease, opium was anything better than a palliative.

Before we dismiss the subject of prurigo, it may fairly be expected of us that we should substantiate our general statement as to the extreme commonness of this disease in public practice. On this head we have to say that, of a thousand consecutive cases of skin disease of all kinds, we found one hundred and sixty-six to be cases of prurigo such as we have described it, the number of cases of scabies in the same enumeration being only one hundred and forty-six ; so that, if this calculation be taken as a standard—and it must be conceded that a thousand cases afford a sufficient basis for casting a fair average—we must conclude that prurigo is a commmoner disease even than scabies : that it constitutes as nearly as possible one-sixth of the number of cases of cutaneous disease that are met with in public practice, and that with scabies it constitutes about one-third of the total of skin disease in this country. So that, if we take only two of the animal-parasite diseases of the skin (and we have others yet to deal with), we can account for one-third of the persons who suffer with skin disease, and the majority of this third are persons afflicted with the most severe, the most "incurable," and one of the most chronic of the affections to which the human skin (at least in this country) is liable.—*Medical Times and Gaz. June* 6, 1868, *p.* 600.

87.—IODIDE OF SULPHUR IN THE TREATMENT OF PORRIGO FAVOSA.

By Dr. Daniel Donovan, Jun., Skibbereen, Co. Cork.

[The following cases illustrate the beneficial action of iodide of sulphur in porrigo favosa, commonly known as scald head.]

John Riley, aged 18 years, William Riley, aged 7 years, and Patrick Riley, aged 5 years, three brothers, were admitted into the Skibbereen Workhouse Hospital, February 27th, 1868, suffering from porrigo favosa in its most aggravated form. The eldest had been affected for eight years—the second for six years, and the youngest for about twelve months; their heads were covered with the mouldy-looking honey-combed crusts peculiar to this disease. In some places where the crusts had fallen off, the integument presented a red-glazed looking appearance, studded here and there with yellow pustules, and totally devoid of hair; their general health was good, and neither of them any indication of a scrofulous diathesis.

During two months succeeding their admission into hospital various plans of treatment were adopted, such as the use of sulphur and citrine ointments, corrosive sublimate and nitras argent solutions, and also painting the diseased surface from time to time with tinct. iodine. Temporary relief was occasionally afforded, but the disease invariably returned in as bad a form as ever. On the 21st May, the following treatment was adopted, and produced quite unexpectedly a speedy and permanent cure. After softening and detaching the crusts by the application of linseed-meal poultices, an ointment composed of iodide of sulphur, ʒi., adeps. ℥iss., intimately mixed together, was ordered to be well rubbed into the diseased patches night and morning. This treatment was continued regularly, and on June 10th, a fortnight after it had been first adopted, a marked improvement had taken place; the formation of fresh scabs was arrested, the red patches of skin had almost disappeared, and hair began to grow from several portions of the scalp which were previously bald.

The three patients were discharged cured from hospital, June 30th, as there were no indications whatever of a return of the disease, and their heads were uniformly covered with hair.

If the iodide of sulphur treatment should prove equally beneficial in most other cases of porrigo, it would supply a very simple means of arresting this disease, instead of having recourse to the internal use of arsenic and iodine, and the application of caustic and poisonous lotions to the skin: the use of which remedies in the case of children, is attended with considerable risk, especially in country districts where one must often rely upon ignorant and careless people to administer them, and therefore must be very guarded how he intrusts to the hands of such persons medicines that might prove fatal, if not carefully given in the prescribed dose, or not used as otherwise directed.

It is not many years ago, before the true nature of porrigo was discovered, when the barbarous plan of applying pitch caps to the scalp was adopted on the Continent, and in some parts of Ireland where the disease was tolerably prevalent. These pitch caps consisted of strips of stout calico, spread with Burgundy pitch, or some other adhesive material, and after being firmly applied to the scalp, they were forcibly torn off in a direction contrary to the growth of the hair, so as to tear the hairs out from their roots; this plan was adopted under the erroneous impression that the disease originated in a morbid condition of the hair bulbs, and not unfrequently either scalped the victim or produced death. In this case, as in many others, microscopic and chemical research have come to the aid of medicine. The microscope has determined that porrigo favosa depends on the formation of low vegetable growths of a fungous nature (achorion schönleinii) in the deeper layers of the epidermis and upon the surface of the cutis, attacking the hair follicles, and causing alopæcia in most cases. Chemical researches have discovered that sulphurous acid in a fluid or gaseous form, and the sulphites, especially the hyposulphite of soda, and the compound resulting from the union of iodine and sulphur, have a sort of special capacity for destroying the vitality of such vegetable organisms when they come in contact with them, and we thus have a rationale to follow out, when applying these remedies to the treatment of porrigo favosa, instead of having recourse to hap-hazard modes of treatment which generally produce more harm than good, and invariably aggravate the sufferings of those who are the victims of the disease under consideration.—*Medical Press and Circular, July* 15, 1868, *p.* 69.

88.—NEUROTIC RELATIONS OF HERPES.

Our readers will peruse with much interest the valuable suggestions of Dr. Handfield Jones in another page of this journal. While those observations are fresh in their minds, we will shortly narrate a case that bears upon the important question of nerve-influence in the development of disease, and may be taken as a living diagram of the phenomena. A healthy young man, a banker's clerk, perceived on Saturday evening a tenderness in his left groin, and discovered a lump which turned out to be a swollen lymphatic gland. The gland was situated just below Poupart's ligament, midway between the anterior spine of the ilium and the spine of the os pubis. It was not particularly painful; and he knew of no cause that could have given rise to it, unless, perhaps, a blow from the corner of a ledger in walking past his desk.

Forty-eight hours later, namely on Monday evening, his attention was attracted to an itching sensation over the great trochanter of the same limb; and at bedtime he discovered an oval red blotch about two inches long by one in breadth. At the present time (Wednesday) this blotch is evidently a herpes, composed of a cluster of about forty angry-looking papulæ, not as yet arrived at the stage of vesicles; the patch is red and angry, possibly on account of pressure or friction by his clothes, the seat of the patch being the most prominent point of the hip. With the exception of a single non-herpetic pimple three or four inches above the blotch, there is no evidence of other eruption.

Looking at the two lesions, the tender gland and the blotch of herpes, what is the significance of the appearances? The gland first made itself evident; perhaps a slight blow with the corner of the ledger may have disturbed its healthy condition. The same nerve, the external cutaneous, supplies both points of interest. Was the cause one which affected both organs simultaneously? Or, was the affection of the skin a reflex irritation? Probably the latter. The first motive may have been the blow; the second the bruised gland; the third the irritated nerve; the fourth the reflection of the irritation on the neighbouring skin; a nerve paresis. Dr. Handfield Jones's case tended to show a neuralgia of one nerve, with a cutaneous manifestation of weakened nerve-force in a neighbouring nerve. Ours tends to a somewhat similar conclusion, namely, the reflex relation between a subcutaneous organ and a neighbouring part of the skin; between the deep and the superficial. The subject is a mine of pathological wealth.—*Journal of Cutaneous Medicine, July* 1868, *p.* 220.

89.—NOTES ON ACNE ROSACEA.

By Dr. H. S. Purdon, Physician Belfast Dispensary for Diseases of the Skin, Assistant-Physician Belfast Charitable Infirmary and Institution, &c.

The nose is the common seat of acne rosacea, the integument being of a deep violet colour, covered with elevations which slowly suppurate. The affected skin is thickened and infiltrated, and in chronic cases the alæ are pendulous, granulated, and liable to ulceration, in many instances the superficial veins are enlarged and varicose.

Mr. E. Wilson considers acne rosacea to be an eczematous affection, and Hebra states that "accumulated sebaceous matter often sets up an inflammation of the follicles, which would naturally be termed a folliculitis, but is generally called acne." This observation endorses the statement of Dr. Ross, who looks on acne rosacea as due to a determination of blood to the capillary vessels—a hyperæmia—which leads to inflammation of the sebaceous follicles, which pustulate, but do not mature readily.

Hardy considers acne to be a purely local disease, and, according to Mr. E. Wilson, "Gutta rosacea originates in debility, most frequently assimilative, next nutritive and sometimes nervous, is chronic in duration, and possess close sympathies with the digestive and reproductive organs."

In gutta rosacea, as well as the other forms of acne, the tongue is generally covered with a white, creamy fur, especially in the morning. When such is the case, the best treatment to commence with is the administration of the sulphates of iron, magnesia, and quinine given in infusion of calumba. This mixture will have the effect of cleaning the tongue, gives tone to the stomach, acts as a mild aperient, and prepares the way for the administration of arsenic. I agree with Mr. Milton that "lowering remedies" are injurious in acne rosacea, which is a disease due to debility, the subjects of it having usually impaired appetites and weakened digestion. Tonic remedies are indicated, and nitro-hydrochloric acid in decoction of cinchona has been recommended, especially as it acts on the liver, an organ generally at fault. The internal use of cod-liver oil is also very beneficial. But to cure this disease permanently it is generally necessary to put the patient under a course of arsenic, and which may be commenced as soon as the tongue is clean and the liver in proper working order; the preparation that I usually prescribe is the liquor sodæ arseniatis, given in doses of ten drops thrice daily after food. In some cases where the patients are what is commonly called "bilious," it is necessary to order taraxacum, and the following is a good form for its administration; it also acts as a diuretic:—

℞. Decoct. scoparii, ad ℥viii.; spt. etheri nitrosi, ℥ii.; succi taraxici ℥i. Sig., a tablespoonful three times in the day.

For flatulence, a common complaint amonst these patients, the efficacy of the compound tincture of cardamom is well known, or the following, if the appetite is impaired and depression of spirits complained of:—

℞. Tinct. valerian ammoniat, ℥iss.; quinæ sulphat, gr. xx. Sig., a teaspoonful three times a day in a wineglassful of water.

The nitro-hydrochloric acid foot-bath is also a valuable agent.

In the treatment of acne rosacea by external applications, the hypochloride of sulphur ointment, one drachm to the ounce, is a very valuable application, and stands first on the list in importance, being superior to the iodide of sulphur. The following ointment I have used in several cases with the best results:—

℞. Hydrargyri iodi virid, gr. x.; sulphuris, ʒi.; adeps, ℥i. A little oil of bergamot or bitter almonds may be added to cover the smell of the sulphur. Individuals, the subject of acne after exposure to excess of heat, as over a large fire, are frequently troubled by an increase of inflammation of an acute nature in the affected part. In such cases the constant application of the "glycerole of starch" for a few days is of benefit, and in place of soap the following may be used:—Take of glycerine, by weight, five parts, yolk of egg four parts, mix; this application, which has lately been recommended in the Philadelphia Journal of Pharmacy, is of a very soothing nature, and is of the consistence of honey, a little of which can be applied before exposure to cold, heat, &c.

In inveterate cases, painting the part affected with the solution of the terchloride of antimony for a few seconds, and afterwards applying a sponge soaked in a solution of carbonate of soda, is of benefit, especially when the integument is much thickened; a poultice of rice-flour being applied at night; or Dr. Ross's method of treatment may be adopted instead, which consists in puncturing each separate tubercle, and inserting an ordinary capillary vaccination tube, containing a drop or two of nitric acid. This excites inflammation of the follicles, and thus occasions obliteration. I can strongly recommend this method of treatment, as I have found it successful in many cases where ointments and lotions had proved useless.

It is a common custom to prescribe the bichloride of mercury in the form of a lotion in the treatment of acne; now, if this remedy be persevered in for any length of time, it occasions a scaliness and hardness of the cuticle which is very annoying. Borax has quite the contrary effect; it is equally efficacious, and can be prescribed in conjunction with glycerine and tincture of benzoin. —*Medical Press and Circular, June* 10, 1868, *p.* 496.

90.—THE CURE OF LUPUS BY CAUTERIZATION.

By JONATHAN HUTCHINSON, Esq., Surgeon to the London Hospital.

I have for several years employed the actual cautery rather freely in the treatment of lupus, and for some purposes I much prefer it to the fluid escharotics. It is especially adapted for cases in which there is much swelling or thickness of diseased tissue. Two of the worst cases of "lupus with hypertrophy" which I have ever seen, were under my care in the London Hospital during the past year. In each the whole face was involved, and with extreme disfigurement. We pursued the same plan in each. The patient was put under chloroform, and the actual cautery freely used, the point of the iron being thrust deeply into the swollen tissues at many parts. I was particularly careful to cauterise the edges of the patches. We obtained admirable results in both cases, and results which delighted the patients. One of them came to me from the country a year later to show her face, and the condition surpassed anything that I could have expected. There were no ulcers or scabs remaining, all was soundly healed; the swelling was greatly reduced, and in most parts the cicatrix was pale and healthy. Two or three applications at intervals of a month are usually needed. The good effects must not be expected quickly; for a while the state appears to have been made worse, but after some months the advantage gained becomes apparent, and scars take the place of ulcers. The actual cautery causes very little pain afterwards, much less than nitric acid or chloride of zinc.—*Clinical Lectures and Reports of the London Hospital*, 1867-8, *p.* 218.

91.—ON THE THERAPEUTIC VALUE OF OIL AND WATER IN THE TREATMENT OF SKIN DISEASES.

By Dr. John Hughes Bennett, F.R.S.E., Professor of the Institutes of Medicine, and Senior Professor of Clinical Medicine in the University of Edinburgh.

The skin, as is well known, is furnished with two kinds of glands for the purpose of keeping it soft and pliable—viz., sebaceous and sudoriparous glands. While the excretions they pour forth serve other important purposes among the general uses of the economy, there can be little doubt that they have a special action on the skin itself. Further, their diminution or suppression is a circumstance that materially influences the progress of various diseases which attack this important organ. Observation has induced me to believe that there are some of these which more especially affect the oily, whilst others injure the watery secretion. For example, prurigo, lichen, and the scaly diseases are accompanied by dryness of the skin, whilst eczema and impetigo are accompanied by excessive moisture of the surface. Be this as it may, experience has convinced me that there is a class of skin disorders which are readily cured by applying oil or grease constantly to the surface, whilst there is another class which require a similar application of water. Moreover, I believe, although innumerable ointments and lotions have long been employed in cutaneous diseases, that the active agents in all of them, with few exceptions, are not the drugs which they hold in suspension or solution, but simply the oily or watery matters which constitute the bases of these preparations. The establishment of this doctrine, and the careful discrimination of the diseases or textural alterations which require the one remedy or the other, must not only simplify but give greater precision to our therapeutical efforts for their proper management

Indications for the employment of oil.—In all cases where there is excessive dryness of the skin, inunction with oil or grease is necessary. For eruptions which are essentially dry in their nature, such as prurigo, lichen, psoriasis, lepra, pityriasis, favus, &c., oil or grease are essential remedies, and have long been used in the form of various ointments. Pure oil, though beneficial when friction is desirable, and used as a liniment, is too thin and too easily removed from the skin to produce a permanently emollient effect on indurated epidermis. Hence grease or fat, that is, inspissated oil, has long been employed as ointment. Even this, however, rapidly melts on the surface of the warm skin, and is soon rubbed off, or absorbed by the clothes or substances on which it is spread. This is corrected by mixing with it various dry powders, such as sulphur, oxide of zinc, calamine, &c. These give to the fat a consistence which renders its action permanent, and prevent its rapidly melting or being too readily lost or absorbed.

I have long satisfied myself that the various powders mixed with fat act mechanically by thickening it, and exert no other therapeutical action. Sulphur ointment, for example, is an excellent application in scabies, because lard thickened with sulphur is more tenacious, more readily blocks up the follicles and grooves inhabited by the itch insect, and thus induces their more perfect asphyxiation. But that sulphur exerts any specific action, either on the insects or on the human economy, is disproved by numerous facts. In the same manner, the oxide of zinc, or white precipitate ointments, are excellent applications in prurigo or lichen; but that zinc or mercury are the active agents which cure is disproved by the circumstance that simple lard will in those diseases, as in scabies, produce, though more slowly, the same effect.

In the scaly eruptions, however, more especially psoriasis and lepra, the admixture with the lard of pitch or tar is essential to success. These substances unquestionably contain a principle with exerts a remarkable local action in the removal of these diseases. I say local, because I have given pitch pills and infusion of tar in large quantities internally without causing any effect whatever. Neither has creasote nor carbolic acid any influence on these scaly eruptions. No remedies probably are so beneficial in relieving pruritus in the skin, especially creasote mixed with ten times its bulk of oil; but in psoriasis they are of no avail. Pitch combined with lard, therefore, is essentially the remedy in squamous diseases of the skin.

It is now twenty-seven years ago that I pointed out, as the result of a series of investigations into the parasitic fungi growing on the skin, that such growths seldom flourished when deprived of access to the air. I therefore proposed, instead of applying various ointments to the scalp in cases of favus, first, to remove the crusts by means of poulticing, and, secondly, to keep the clear surface covered with oil. So long as this is done the head can be kept free from the disease. In recent cases, after six weeks or two months, a permanent cure is not unfrequently produced. In chronic cases, though a cure is never readily obtained, the offensiveness of the disease and all irritation is at once removed. In 1840 I watched with great interest the results of the depilatory treatment carried on in the Children's Hospital, of the Charity Hospital, in Berlin, by Professor Barez. Although two old women were constantly employed there pulling out the hairs from the scalp in cases of favus, in no one single instance did I see a permanent cure effected. The practice has been revived by Bazin and others, but such is the difficulty of thus eradicating the hairs in the human scalp, and such is the tediousness and pain of the treatment, that I do not anticipate much success from its employment. It has been adopted by Dr. McCall Anderson, of Glasgow, in the Skin Dispensary of that city. A few of his cases, said to have been dismissed cured, have found their way subsequently into my Clinical Skin Ward of the Edinburgh Royal Infirmary, with their heads covered with favus. I mention this merely to show how very difficult it must be in hospital and dispensary practice to determine whether a permanent cure has really been produced. Although, therefore, I have tried, and continue to try, every kind of treatment that has been proposed in my Clinical Wards, for the cure of favus, my conviction is that, after removing the crusts, the best is the simple application of oil, combined, in scrofulous children, with good nourishment.

Indications for the employment of water.—In all cases where there is excessive moisture on the surface, originating in vesicular, pustular, or ulcerative diseases, the constant application of water is necessary. I say *constant* because occasional applications by means of lotions or of baths are of little service. For this purpose lint well saturated in water is first applied to the affected parts. This must be covered with oil silk or gutta-percha sheeting, that should well overlap the lint below so as to prevent evaporation. The whole must be kept in its place by a bandage, or the application of strings, which is often a matter of great difficulty. Patients are very slow in accepting the idea that *constant* moisture of the part is absolutely necessary, and they seldom so apply the upper covering in such a manner as to prevent evaporation from the lint below. The result is, it becomes dry, sticks to the inflamed surface, and is a source of irritation rather than of comfort. Hence vigilant superintendence and frequent visits are requisite in order to watch the progress of the case. Even in the hospital, constant care is necessary to see that nurses properly cover the eruption; and when, as sometimes happens, this task is made over to the patients themselves, it almost always fails.

There are some portions of the surface which it is very difficult to keep moist and well covered, such as the face and axilla. But by carefully adapting lint and gutta-percha sheeting, attaching strings to the edges of the latter, to keep the whole in its place, and the covering close to the skin, so as to prevent evaporation, I have never failed in ultimately carrying out my object. For the face it is necessary to construct a mask, having apertures for the eyes, nose, and mouth, and even then it is difficult to exclude the air, especially at the angles of the mouth. When the eruption is very general over the surface, tepid baths continued as long as possible must be had recourse to. Hebra has caused some of his patients to continue in them for weeks together, but of the arrangements whereby he has been enabled to accomplish this I am ignorant.

The effect of the moist application to the acutely inflamed surface, is soon to remove all local irritation, and especially the irritation or smarting so distressing to the patient. It also softens and removes the scales and incrustations, which in themselves often tend to keep up the disease, and prevent cleanliness of the surface. After a time the indurated parts begin to soften; the margins of the eruption lose their fiery red colour, and merge into that of the healthy skin, and, finally, the whole surface assumes its normal character. In the chronic impetigo, which attacks the chin in man, as well as when the scalp or other parts covered with hair are affected, it will be best to remove the crusts, in the first place, by poultices. It is then necessary to shave the parts every other day with a very sharp razor, using flour and warm water as a lather, and not soap; or a pair of sharp scissors with flat blades may be used to cut the hair close to the skin. If this be not carefully attended to, the short thick hairs prevent the application of moisture to the skin, a space is left between it and the lint, in which the discharge collects and concretes, and no progress towards a cure is produced.

This treatment is applicable to eczema, herpes, pemphigus, impetigo, ecthyma, and rupia. In the last case the ulcers, which appear on the disappearance of the crusts, should be treated as isolated sores with water dressing.

The water treatment of these diseases, now described, was first recommended by me in 1849, and will be found detailed in my Clinical Lectures, 5th edit., pp. 837, 839. I then and still cause to be dissolved in the fluid a small amount of alkali—ʒss. of sodæ carb. to a pint of fluid—which renders it emollient and more serviceable in dissolving the purulent crusts. The tendency which so strongly prevails to attribute therapeutic action to drugs rather than to hygienic means, caused many to attribute the good results to the influence of the alkali, and by some it has been called the treatment of eruptions by alkaline washes. But I have been satisfied from the first it is neither the alkali, nor as a wash, that it is serviceable, but that simple water, if only *constantly* applied, is all that is truly necessary.

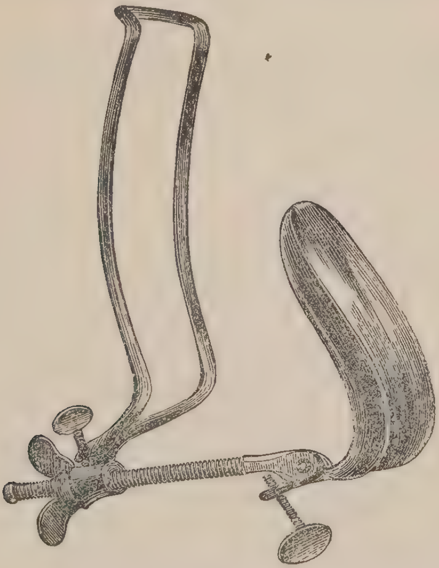
Long experience in the treatment of skin diseases, both in hospital and private practice, has now convinced me that the really active agents in the treatment of those referred to are simply oil and water, if properly applied in appropriate cases. I have also observed that while watery applications have no effect on the dry eruptions, so greasy substances seldom fail to exasperate such as have fluid discharges. A correct diagnosis, therefore, is of the utmost importance. I have frequently had occasion to see in the hands of others much time and trouble lost in applying water to a scaly eruption, and an acute eczema rendered most painful and intense by having pitch or other irritating ointments applied, under the mistaken idea that it was psoriasis. There are certain chronic conditions, however, of originally moist eruptions, where dry induration of the skin is caused, and the nunguents are serviceable. To give a description of the forms and stages in which sometimes one or both may be useful is impossible. Nothing but a lengthened experience of the treatment and familiarity with the appearances of cutaneous diseases under varied conditions will suffice for this. But I have no hesitation in recommending the views and practice now described to my medical brethren, not only as a simple but as the most efficacious method of removing the troublesome disorders referred to.—*Practitioner, Oct.* 1868, *p.* 211.

MIDWIFERY,

AND THE DISEASES OF WOMEN, ETC.

92.—NEW SPECULUM.

The engraving represents a self-holding Vaginal Fistula Speculum, which has been constructed by Mr. Foveaux, of the firm of Weiss and Son. That such an instrument is wanted



can be attested by those who have had to hold the duckbill speculum in protracted and difficult operations. Several contrivances have been devised for this purpose, oneof them a special and complicated operating table, but none of them have given satisfaction in this country. The instrument now under notice and depicted here is applicable in all the various positions for operation in vaginal fistula. It has now been twice used by Mr. Spencer Wells, no assistant being present on the last occasion, and it was found to answer its purpose most effectually. Its mode of action is very simple, the speculum blade or vaginal depressor, of which there are three sizes, being steadily held in the desired position by a counter-pressure arm, which takes its bearing on each side of the spinal column. A screw adjustment approximates these two parts of the instrument in a parallel direction, while the angle of the apex of the speculum, as also that of the counter-pressure arm, can be regulated by small screws.

The instrument is, at the suggestion of Mr. Wells, made entirely of German silver, for the greater facility of cleaning it. One or two napkins serve as padding for the counter-pressure arm.—*Lancet, Oct.* 17, 1868, *p.* 513.

93.—THREE CASES OF PUERPERAL CONVULSIONS COMING ON AT THE COMMENCEMENT OF LABOUR.

By Dr. James Cappie.

[The following paper was read before the Edinburgh Obstetrical Society.]

Case 1.—On the morning of the 5th April 1862, I was sent for to assist my friend Mr. Gibb in a case of puerperal convulsions. Mrs. C. had fallen on the floor in a fit at eight o'clock the previous evening, and since then severe convulsions had continued to come on every half-hour. When I saw her at two a.m. the point of the finger could hardly be introduced into the os uteri, and there did not appear to be any uterine contractions. I punctured the membranes with a common pencil, and tried to dilate the os with the finger, but with little success, on account of the want of expulsive efforts. Chloroform had been freely administered before my arrival, but the fits continued to recur regularly every half-hour. The condition of coma between them was so deep that she could not be made to swallow anything. A glance at the dirty pale, almost anæmic, countenance of the patient was sufficient to convince us that bleeding to any extent was not to be thought of. I left her, with instructions I should be sent for if pains appeared to commence. I was sent for at six a.m., and found the os slightly dilated, and the pains very slight. I again tried to dilate with the finger, and succeeded till it was about the size of a crown piece. The case now appeared very urgent. It was obvious that unless the patient was speedily delivered, she would soon sink from exhaustion.

But the vagina was not relaxed, and the distinction between the internal and external lips of the os was not obliterated ; that is to say, the parts were in the condition in which most eminent authorities insist that instrumental interference is not to be thought of. Still, such interference seemed to be the only chance left to the patient, and I determined to attempt delivery. In the manner to which I shall more particularly allude afterwards, I succeeded in applying the forceps ; then, by making cautious and intermitting traction on the head, and at the same time supporting and pushing back the lips of the os, I got the latter gradually to dilate. After the head had passed into the vagina, the child (dead) was born in a few minutes. This was at eight a.m., and the patient had only two fits from that hour till four p.m., after which they did not return. In the forenoon she had a turpentine injection, which roused her sufficiently to enable her to swallow a little brandy and water, but the comatose condition continued the whole of the next day. Small quantities of stimulants and beef-tea continued to be administered to her, and after consciousness returned, her progress towards convalescence was steady. I may mention that this patient had convulsions in her first confinement ; that, according to her husband's statement, she was then largely bled without the frequency of the fits being affected ; and that, though they had continued a much longer period in her present confinement, her recovery this time was as satisfactory as in her first.

I was sent for to see this patient again a few months afterwards, as she had taken a convulsion fit. She was in the third month of pregnancy, and on examination I found the ovum in the vagina. After it was taken away there was no return of the convulsions.

Case 2.—On the morning of Sunday, 29th March, 1864, I was sent for to see Mrs. M'L , then in the beginning of the eighth month of her first pregnancy. I was informed that she had been obliged to rise about two o'clock on account of severe headache ; that, to relieve this, she had allowed cold water to run from a cistern on her head for a few seconds, and that at four o'clock she was seized with a fit of convulsions. When I saw her, consciousness had returned, but as she was telling me how she had been feeling, another fit came on. After this, consciousness was not for the time recovered, and the fits recurred every half hour. I immediately ordered the hair to be cut off, and leeches to be applied to the temple. I returned at seven a.m., and found the patient as I had left her—unconsciousness persistent and deep, and the fits returning regularly. Drew off a small quantity of water, which I found to be albuminous. I then cupped over the loins, and took away more than a large soup-plateful of blood, and afterwards administered chloroform; but the frequency of the fits was not in the least affected by these means. I made occasional examination, but the os uteri showed no tendency to dilate till five o'clock in the afternoon, when I could introduce the finger within it. On account of its rigidity, and the unrelaxed state of the vagina, the efforts to dilate it were fatiguing for the fingers, and it was half-past seven before I could venture to apply the forceps. This, however, I accomplished before the os was half-dilated. I then set to work, and, in imitation of the natural pains, made intermitting traction on the head, and at the same time continued to dilate with the finger. The child (dead) was born at ten o'clock. From four in the morning till this time the convulsions had been wonderfully regular. Whenever the time was noted, the interval was never above a few minutes more or less than half an hour. After the second fit complete insensibility continued between the fits. From ten o'clock till half-past two next morning she had four seizures—scarcely one in each hour; then she had other four between 2.30 and 11 a.m.; after which they never returned. Altogether she would have forty distinct epileptiform seizures—the most of them severe. In the afternoon her breathing became quiet, and except that she could not be roused from it, her sleep appeared natural. In the evening she was able to swallow a little, and the next two days she readily took in whatever was given to her, but it was Thursday before she looked about her and attempted to speak. So speedy, however, was her convalescence after this, that on the Saturday she was sitting up in bed to her meals and feeling quite well. Thirteen months afterwards, I again attended this patient, when she miscarried at the six months. During pregnancy she had frequent headaches, but no albuminuria. The kidneys were kept active with acetate of potass. There was no return of convulsions. She has been repeatedly pregnant, but miscarries at the sixth or seventh month from diseased placenta.

Case 3.—M. D., aged 30, was admitted to the City Poorhouse on Saturday, 11th April 1868. She supposed herself to be near the end of the ninth month of her fourth pregnancy. On the Sunday forenoon she complained of headache, for which she kept her bed, and at mid-day she had a convulsive fit. The nurse, thinking she might be subject to epilepsy, did not send for medical assistance. The fit soon passed off, leaving the patient drowsy. She got a dose of castor oil, which operated freely, and during the two following days she was going about and feeling in her usual health. She stated that she never had suffered from convulsions before. On Tuesday evening she went to bed feeling well. At 1.30 on Wednesday morning she got out of bed, appearing stupid and not to know what she was about. Immediately on lying down again she was seized with a fit. When this went off, consciousness did not return before another seizure came on, twenty minutes after the first. When I was sent for, I happened unfortunately to be away at another confinement, and did not get the message till after four o'clock. The tenth fit was just passing off when I saw the patient. On examination, I found the os soft, and easily admitting the point of the finger. I separated the membranes as far as I could, and then ruptured them with a stocking-wire. There did not appear to be any uterine contractions. The question then came to be, should I bleed? The patient was a little woman, moderately well nourished, and with a very short neck. The breathing was hurried, the inspirations being short and quick, but without any approach to stertor, and the expirations more prolonged and noisy. In other respects she was perfectly quiet between the fits. All the muscles were flaccid, and the limbs motionless. Pulse 72, regular; the face rather pale; no flushing before the fits; no throbbing of the carotids; in short, nothing to indicate any unusual tension in the circulation. I therefore determined simply to attempt delivery as speedily as possible, and proceeded as I had done in the other two cases. I first dilated the os as far as the uterine inertia would permit. I drew off a small quantity of urine with the catheter, and it proved to be highly albuminous. Indeed, the water in the tube appeared, on being heated, to become converted into a curd. Shortly after five o'clock I applied the forceps, made traction on the head, and continued to push back the os. This was pretty well dilated before any well-marked expulsive efforts were made on the part of the mother, and these efforts were only brought on when I made the initiative by moderate traction. The labour was completed at a quarter past six o'clock. The child, a fine healthy-looking girl, cried lustily as soon as it was born, and up till this time it has kept well. I now expected the severity of the fits to abate, but in this I was disappointed. They continued to recur every twenty minutes, and as strongly as before. When a seizure was about to come on the patient opened her eyes with an expression so placid that one could hardly help thinking she was about to become conscious. But this was only for a couple of seconds; immediately the head was turned to a side and thrown back; the eyes were rolled upwards towards a corner of the orbit and the mouth opened with a short cry, resembling a suppressed exclamation of dread; then the muscles of the face drew the features into ugly contortions; the arms were thrown out with rapid whirling and striking movements, as if passionately aiming blows at an imaginary antagonist; the body, too, wriggled with movement, and the legs were fairly lifted off the bed with a rapid violent pattering action. As the fit was going off, the limbs first became quiet, the arms fell with one or two spasmodic jerkings of the shoulders, and the working of the face—now livid from venous engorgement—disappeared with a few twitching movements. Abundant frothy mucus, occasionally tinged with blood, came from the mouth. Till another fit came on the most complete relaxation was present; neither head, hand, nor foot stirred, but lay in whatever position it was placed. The respiration continued hurried, but was never stertorous. Early in the morning her hair was cut off, and six leeches applied to the temple. A turpentine injection was also given, and acted freely. In the forenoon I tried the inhalation of chloroform. None of these means had any effect in moderating the fits; they continued regularly till midnight, by which time she must have had about seventy seizures. From 12 o'clock till 6 a.m., on Thursday she had one fit each hour. During the day she had only slight seizures on the right side, the arm being thrown up as far as it could be raised; pulse had become very quick and weak. She had a severe fit in the evening at 10.30, and others on Friday at 3 a.m. and 5.30 a.m. In the forenoon she kept very quiet, and was able to swallow a little spirits and water. I saw her at 11 a.m., and felt very sanguine she would rally. The respiration was tranquil; pulse 80; the kidneys were acting freely. An hour afterwards, however, the breathing suddenly stopped. The nurse thought she was about to become convulsed again, but no fit came on, and the breathing did not return. I may mention, that the mother of this patient also died from childbed convulsions.

Remarks.—In detailing these cases, I have no intention to enter on the general pathology and treatment of puerperal convulsions; my special object has been to illustrate the safety of early instrumental interference when such seizures occur in the early stage of labour. As this is a point in practice on which authorities still differ, any facts bearing on it are not likely to be considered superfluous. Since I gave notice to your secretary that I would give an account of these cases here, a paper on Puerperal Convulsions has been published by Professor Dyce, of Aberdeen, in which occur the following remarks on this subject:—He says, "But there is another and very important part in the treatment which remains to be considered. The patient is suffering from a disease dependent upon the state of the uterus; which state, it is believed, can only be got rid of by terminating the labour. What, then, are the principles that should guide us regarding delivery in these difficult cases? In short, will it be proper to interfere with the progress of gestation or parturition? As far as my own experience goes, I believe that generally interference is prejudicial, in whatever stage of the labour the convulsions may occur. Most assuredly during gestation, and before labour has commenced, it will be universally conceded, as admitting of no dispute, that until labour has commenced any interference on our part would be highly injurious,—so that in convulsions during pregnancy we have, as Gooch, says, 'nothing to do with the uterus, but solely to attend to the convulsions.' It will be also equally admitted, that in the first or early stage of labour, should convulsions come on, every attempt by the finger or other artificial means to dilate the os uteri ought to be avoided, as it will be found not only to bring on convulsions, but generally to increase them in violence. Denman assures us that he 'attempted gently during every pain to assist in the dilatation of the os, but he was soon convinced that the convulsions were not only brought on and continued, but increased in violence; he therefore desisted, and left the work of delivery to nature.' Thus, then, before labour comes on, and in the first stage of labour, I consider interference wholly inadmissible, and only tending to increase the danger." To these principles scarcely any practice could be more directly opposed than what I have detailed. I interfered in the first stage of labour, and that roughly, but I also think rightly. In the first place, the conviction on my mind is very strong, that if I had not so interfered, all the mothers I have spoken of would have died undelivered; and, in the second place, I submit that my interference did not at all aggravate the fits. All the cases had this characteristic in common, that the seizures came on at wonderfully regular intervals, and that for hours before the uterus was meddled with. In one case chloroform, and in another bleeding, did not affect the length of the interval. Then—and in connexion with the quotation I have just given—this is a point on which I must lay great stress,—in not one of the cases was either the frequency or severity of the fits in the least affected by the attempts to dilate the os with the finger, nor by the still more severe process of dragging the head against its inner surface, and at the same time pushing back its edges with some degree of force. The inference which such facts naturally suggest is, that the fear of aggravating the fits by interfering with the os is entirely visionary.

Another point in the treatment of puerperal convulsions, in regard to which difference in practice exists, and on which the above cases may provoke criticism, is blood-letting. I may possibly be asked, why this was not carried to a greater extent in their treatment. To this I have simply to answer, that none of the cases presented vascular or constitutional indications for the free use of the lancet. The first was a weakly ill-nourished anæmic woman, who evidently had not a drop of blood to spare. The second case presented a very characteristic specimen of the lymphatic temperament--plump in appearance, but soft and spiritless. I bled her to a moderate extent without any effect on the seizures, and my conviction is that I would have lessened the chances of her recovery if I had bled her to the extent frequently recommended. The third case was that of a stouter woman, with a short neck; still there was no plethora, the circulation was quiet; there was certainly no determination of blood to the head; and the experience of the two previous cases had led me to put some faith in patient waiting.

There are a number of considerations which I think may be allowed to have weight with one before taking away from twenty to eighty ounces of blood in these cases. In the first place, it appears to me that the great danger to life lies in exhaustion; and my third case illustrates this in a marked manner. On the second day of her illness, I felt so hopeless in regard to her condition that I did not think of interfering, but I now regret very much that I did not make an effort to sustain her strength with nourishing enemata. From the marked improvement that took place on the third day, I feel convinced that a little more vitality, such as a moderate amount of nourishment might have imparted, would have enabled her constitution to tide over the danger. Certainly, if ever I have a case of the sort again, this is a point in practice I shall be inclined perseveringly to attend to.

Then, in regard to the pathology of epileptiform seizures, the opinion appears to be gaining ground, that during their continuance the brain is anæmic, and not congested; that the blood is watery, and not over-abounding in red corpuscles If this view be correct, then bleeding can only exert a beneficial effect by diminishing the absolute amount of a supposed poison in the blood. But it is to be remembered that the most certain effect of blood-letting is to increase the proportion of the watery elements in the circulation; and it may therefore be a question whether, in uræmic convulsions, the *relative proportion* of irritating material in the blood may not also be increased by large bleedings. In this view, the occurrence of a convulsion, *per se*, is no more a reason for taking away a large quantity of blood than is the occurrence of a paroxysm of delirium tremens.—*Edinburgh Medical Journal, October* 1868, *p.* 315.

94.—ON TURNING WHEN THE LIQUOR AMNII HAS RUN OFF, THE UTERUS BEING CONTRACTED UPON THE CHILD.

By Dr. Robert Barnes.

[The following paper is intended to illustrate and advocate the principle of seizing the knee of the child opposite to the presenting shoulder, in turning under the circumstances mentioned in the heading.]

The first question to determine is *Which hand will you pass into the uterus?* The left hand should be preferred. In the majority of cases the child's back is directed forwards; to reach the legs, which lie on the abdomen, your hand must pass along the hollow of the sacrum, and this can hardly be done, the patient lying on her left side, with the right hand, without a most awkward and embarrassing twist of the arm. I need scarcely point out how violent and unnatural a proceeding it would be to pass up the right hand between the child's back and the mother's abdomen, to carry the hand quite round and over the child's body in order to seize the feet which lie towards the mother's spine, and then to drag them down over the child's back. If you attempted this, you would probably get into a difficulty. The child, perhaps, would not turn at all. To avoid this failure, the rule has been laid down to pass your hand along the inside or palmar aspect of the child's arm. This will guide you to the abdomen and the legs. Or the rule has been stated in this way:—Apply your hand to the child's hand, as if you were about to shake hands. If the hand presented to you be the right one, take it with your right, and *vice versa*.

Rules even more complicated are proposed, especially by Continental authors. Some go to the extent of determining the choice of hand in every case by the position of the child. The fallacy and uselessness of these rules are sufficiently evident from the disagreement among different teachers as to which hand to choose under the same positions. Rules, moreover, which postulate an exact knowledge of the child's position, are inapplicable in practice, because this diagnosis is often impossible until a hand has been passed into the uterus; and it is certainly not desirable to pass one hand in first to find out which you ought to use, at the risk of having to begin again and to pass in the other.

The better and simpler rule is this:—*In all dorso-anterior positions, lay the patient on her left side; pass your left hand into the uterus*—it will pass most easily along the curve of the sacrum and the child's abdomen; *your right hand is passed between the mother's thighs to support the uterus externally.*

In the case of *abdomino-anterior positions, lay the patient on her back, and you may introduce your right hand, using the left hand to support the uterus externally.* If the patient is supported in lithotomy position, you can thus manipulate without straining or twisting your arms or body. But it is equally easy to use the left hand internally if the patient is on her back, so that the exception is only indicated to suit those who have more skill and confidence with the right hand.

We will first take a dorso-anterior position. Introduce your left hand into the vagina, along the inside of the child's arm. The passage of the brim, filled with the child's shoulder, is often difficult. Proceed gently, stopping when the pains come on. At the same time support the uterus externally with your right hand. Sometimes you may facilitate the passage of the brim by applying the palm of the right hand in the groin, so as to get below the head and to push it up. This will lift the shoulder a little out of the brim. Or you may practice a manœuvre attributed to Von Deutsch, but which had been practised by Levret. This consists in seizing the presenting shoulder or side of the chest by the inside hand, lifting it up and forwards, so as to make the body roll over a little on its long axis. This may be aided by pressure in the opposite direction by the outside hand on the fundus uteri, getting help from the bi-polar principle.

Sometimes advantage is to be gained by placing the patient on her elbows and knees. In this position you are favoured by gravity, for the weight of the fœtus and uterus tends to draw the impacted shoulder out of the brim.

The brim being cleared, your hand passes onwards into the cavity of the uterus. This often excites spasmodic contraction, which cramps the hand, and impedes its working. Spread the hand out flat, and let it rest until the contraction is subdued. In your progress you must pass the umbilicus, or a loop of umbilical cord will fall in your way. Take the opportunity of feeling it to ascertain if it pulsates. You thus acquire knowledge as to the child's life. But you must not despair of delivering a live child because the cord does not pulsate. I have several times had the satisfaction of seeing a live child born where I could feel no pulsation in utero. You are now near the arm and hand. They are very apt to perplex. Keep, therefore, well in your mind's eye the differences between knee and elbow, hand and foot, so that you may interpret correctly the sensations transmitted by your fingers from the parts you are touching.

At the umbilicus you are close to the knees. The feet are some way off at the fundus of the uterus applied to the child's breech.

What part of the child will you seize? It is still not uncommon to teach that the feet should be grasped. You will see pictures copied from one text-book to another, representing this very unscientific proceeding. There ought to be some good reason for going past the knees to the feet, which are further off and more difficult to get at. Now, I know of no reasons but bad ones for taking this additional trouble. You can turn the child much more easily and completely by seizing one knee. Dr. Radford insists upon seizing one foot only for the following reason :— The child's life is more frequently preserved where the breech presents than where the feet come down first. A half-breech is also safer than cases where both feet come down. The dilatation of the cervix is better done by the half-breech. The circumference of the breech, as in breech presentations, is from twelve to thirteen and a half inches, nearly the same as that of the head; the circumference of the half-breech, one leg being down, is eleven to twelve and a half inches, whilst the circumference of the hips, both legs being down, is only ten to eleven and a half inches.

But a knee is even better than a foot. You determine, then, to seize *one* knee; which will you choose? The proper one is that which is furthest. The reasons are admirably expressed by Professor Simpson. We have a dorso-anterior position—the right arm and shoulder are downmost—these parts have to be lifted up out of the brim. How can this be best done? Clearly by pulling down the *opposite* knee, which, representing the opposite pole, cannot be moved without directly acting upon the presenting shoulder. If the opposite knee be drawn down, and supposing the child to be alive or so recently dead that the resiliency of its spine is intact, the shoulder must rise, and version will be complete, or nearly so. But if both feet are seized, or only the foot of the same side as the presenting arm, version can hardly be complete, and will, perhaps, fail altogether. —*Medical Times and Gazette, June* 20, 1868, *p.* 655.

95.—USE OF BARNES'S DILATORS IN INDUCTION OF PREMATURE LABOUR.

By Robert S. Cross, Esq., Petersfield.

[The patient in her two previous labours had been delivered by turning with great difficulty, owing to projection of the promontory of the sacrum. Mr. Cross advised on the present occasion that premature labour should be induced. This was endeavoured to be effected by the free administration of ergot of rye. After this had been given some time and no pains induced,]

On examination, I found the vagina cool and moist, the cervix uteri obliterated, and the os low down and well within reach, open to the extent of readily admitting the first joint of the index finger of the left hand, with which I made a little dilating movement for a few minutes, and then introduced the smallest size Barnes's dilator; it glided in off my finger, without any trouble whatever. This was filled, and left in for about an hour and a half, at the end of which time the next size was introduced as readily. This was gradually filled, according to the sense of distension expressed by the patient, and observed by the finger round the margin of the os. I allowed this to remain in about an hour, towards the end of which time, pains, not over strong, but regular and of a somewhat expulsive character, began. On removal and examination, the membraness were found presenting (tense during pain), and the os about the size of the top of an egg-cup. Hoping that the uterine action (for which there had been great inaptitude all along) would now go on vigorously, and wishing for the child's sake, to keep the membranes intact to the latest moment, I waited. The action, however, quickly subsided ; and I then introduced No. 3, the largest-sized dilator. This was gradually filled, and allowed to remain about half an hour. The patient complained a good deal of distension. There were no pains ; in fact, there seemed just that suspension of the process of labour often observed under natural conditions. I ordered nourishment to be given at intervals, and that I should be sent for in case of pains setting in. This was at 8 a.m. on the 14th. Her condition remained the same thoughout the day ; when, after a few pains, she was delivered of a fine child at 7.45 p.m , not living. She made a quick recovery, without hindrance, being down stairs at the week's end.

The case appears to me to offer points of some practical value as to the mode of inducing premature labour by the mixed plan of ergot and Barnes's dilators. I had not much experience of these, or should, I think, in the present case, have ruptured the membranes immediately on the withdrawal of dilator No. 2. No. 3 seemed to paralyse the uterus for a time by over distension.

With regard to the best mode of bringing on labour, that does not appear to me to be necessarily the best which is the quickest. That mode most recommends itself to me by which the uterus, with its contents, can be best brought into a condition simulating natural labour before local interference is resorted to, in order that, when this is done, it may not only be more facile, but quicker as to results at a period when time, to the life of the offspring more especially, is of the greatest importance. Then, as to freedom from danger, there are well-authenticated cases of death from the douche plan ; and the introduction of a catheter or foreign body into the cavity of the uterus, without any preliminary, does not commend itself on the score of inducing action in that organ in anything like a natural manner. The relaxing effect of the warm bath, the sympathetic irritation induced by purgative action and abdominal friction, followed in due course by secale, pushed more or less, according to individual proclivity to its specific action, undoubtedly bring about that descent of the abdominal tumour, that shortened neck and patulous os, together with the moistened and ready state of parts so beautifully arranged by nature as the first stage of natural labour. Arrived at this point, it appears to me that, by the aid of Barnes' dilators, we have it in our power to complete the labour quickly and safely for both mother and child ; and, as the talented inventor could no doubt corroborate, it makes a good deal of difference in the facility of using these, whether the os is so high up as only just to be felt with the extreme end of the finger, or so low down as to be well within reach.—*British Medical Journal, Aug.* 1, 1868, *p.* 105.

96.—ON TURNING IN CONTRACTED PELVIS.

By Dr. Robert Barnes, Obstetric Physician to St. Thomas's Hospital.

The value of turning in moderate degrees of pelvic contraction rests greatly upon the truth of the following propositions :—*The head will come through the pelvis more easily if drawn through base first than if by the crown first.* Baudelocque affirmed this proposition ("L'Art des Accouchements"). He said—"The structure of the head is such that it collapses more easily in its width, and enters more easily when the child comes by the feet, if it be well directed, than when it presents head first." Osiander had maintained the same opinion. Hohl (1845) also pointed out that the bones overlapped more readily at the sutures when the base entered first. Simpson (1847) insisted strongly upon the truth of this proposition, and illustrated the mechanism of head-last labours with much ingenuity. The proposition has, however, been disputed, and that by Dr. M'Clintock (*Obstetr. Transact.*, vol. iv., 1863). He says—"I do not believe that the diameters of the head are more advantageously placed with regard to those of the pelvis, nor can I believe that the head is more compressible when entering the strait with its base than when it does so with its vertex, till this be demonstrated by direct experiment."

It is also contested by Professor E. Martin, of Berlin (*Monatsschr. f. Geburtsk.* 1867). He especially insists that when the vertex presents moulding may go on safely for hours ; but that if the base comes first the moulding must be effected within five minutes to save the child.

I venture to submit that I have made such clinical observations as are equivalent to direct experiments. In the first place, let me state a fact which I have often seen. A woman with a slightly contracted pelvis, in labour with a normal child presenting by the head, is delivered after a tedious time spontaneously or by the help of forceps ; the head has undergone an extreme amount of moulding, so as to be even seriously distorted. The same woman in labour again is delivered breech first ; the head exhibits the model globular shape, having slipped through the brim without appreciable obstruction. For examples see my outlines of heads (*Obstet. Trans.*, 1866).

In the second place, I have on several occasions been called to an obstructed labour in which the head was resting on a brim contracted in the conjugate diameter. Of course, nature had failed ; the *vis a tergo* was insufficient. I have tried the long double-curved forceps, trying what a moderate compressive power aided by considerable and sustained traction would do to bring the head through, and have failed. I have then turned, and the head coming base first has been delivered *easily*. Upon this point I cannot be mistaken. And I think this greater facility can be explained. Dr. Simpson has illustrated by diagrams how the head, caught in the conjugate at a point below its biparietal diameter, is compressed transversely as traction-force is applied below, causing the mobile parietals to collapse and overlap at the sagittal suture. And surely no one can doubt that the traction-power, and therefore the compressing power, acquired by pulling on the legs and trunk is infinitely greater than can be exerted by the strongest forceps. But there is another circumstance in the clinical history of head-last labours in narrow conjugate which affords a remarkable illustration of this proposition. *The head is rarely, or never, seized in its widest transvere diameter; it is seized by the conjugata at a point anterior to its greatest width—that is, in the bi-temporal diameter;* the bi-parietal and occiput commonly finding ample opportunity for moulding in the freer space left in the side of the pelvis behind the promontory. The head, in fact, fits or moulds into the kidney-shaped brim wherever there is most room. I have given illustrations of this point also in the memoir referred to (*Obstet. Trans.* 1866). I think, therefore, it may be taken as demonstrated that the head coming base first passes the contracted brim more easily than coming crown first. And if the head comes through more easily, it may be inferred that the child will have a better prospect of being born alive.

Can we define with any precision the conditions as to degree of pelvic contraction that are compatible with the birth of a living child ? The question is not easy to answer ; nor is it important to be able to answer it very precisely. The great fact upon which the justification of the operation rests in this : many children have been delivered by it alive, with safety to the mother. We know accurately only one element of the problem—namely, the degree of contraction of the pelvis. The other element the relative size and hardness of the fœtal skull, we can but estimate. *We must assume, in many cases, a standard head.* With this assumption the practical question is reduced to this : *What is the extreme limit of pelvic contraction justifying the attempt to deliver by turning?* In other words this means : What is the narrowest pelvis that admits of the passage of a normal head ? This is answered chiefly by experience. It is not to be answered by *a priori* reasoning like that urged by Dr. Fleetwood Churchill, who says, even in his last edition ("Theory and Practice of Midwifery," 1866) :—"The bi-mastoid diameter in the six cases measured (by Dr. Simpson) varied from $2\frac{6}{8}$ to $3\frac{2}{8}$ inches, and a living child can pass through a pelvis of $3\frac{2}{8}$ inches antero-posterior diameter, with or without the forceps. With a pelvis of this size, then, the operation is unnecessary ; and if the antero-posterior diameter be less than $2\frac{6}{8}$ inches, the operation would be impracticable. These, then, are the limits of the operation ; for us to attempt to drag a child through a smaller space would be unjustifiable."

To this statement of the case serious objections may be taken. The proposition that a living child can pass through a pelvis with an antero-posterior diameter measuring 3·25″, with or without the forceps, can only be accepted with considerable qualifications. I claim to speak with the confidence drawn from large experience when I say that a head of standard proportions and firmness will hardly ever pass a conjugate reduced to 3·25″ without the forceps, and very rarely indeed with the forceps—that is, alive. I might even extend the conjugate to 3·50″, and affirm the same thing. The compressive power of the forceps, unless very long sustained, is not great, rarely great enough to reduce a bi-parietal diameter of 4·00 to 3·50 without killing the child. My opinion, then, is that a standard head, especially if it happen to be a female head which is more compressible than a male one, *may be* drawn through a conjugate of 3″, but not with much prospect of life ; and that the proper range of the operation of turning is from 3·25 to 3·75″, at the latter point coming into competition with the forceps. I believe no one advocates resort to turning when the conjugate measures less than 3″.

A correlative proposition to the foregoing is the following :—*—Compression of the head in its transverse diameter is much less injurious to the child than compression in its long diameter.* The truth of this is attested or admitted by most authors who have considered the point. It is insisted upon by Radford, Ramsbotham, and Simpson. It is confirmed by the observation of the form which the head assumes under moulding in natural labour, which, as I have shown, is effected by the lengthening of the fronto-occipital diameter and the shortening of the transverse diameter. (Obstet. Trans. vol. vii. 1866, and Medical Times and Gazette, vol. ii. 1867..)

Now, it is an almost necessary consequence that when the head arrested on a contracted brim is seized by the forceps, it is seized by its fronto-occipital diameter, and to the longitudinal compression is added the increased obstruction to the entry of the head into the narrowed conjugate caused by the lateral bulging.

We will now discuss the question—What is the penalty incurred, or how can we retrieve our error, if we turn and fail to bring the head through the too contracted brim ? Undoubtedly, the patient will have to go through a second operation. We are driven to perforate after all. We have tried to save the child, and have failed. Is the mother imperilled by this attempt and failure ? This also must be answered by experience. Of course, the mother may suffer if we persevere in dragging the child too long and too forcibly. But we have a right to assume that the attempt is controlled by skill and discretion. The amount of force that can be safely endured is very great—far greater than those who have never seen the operation would readily credit. The violence to which the soft structures are subjected seems to be small in proportion to the traction-force exerted. There appears to be some saving or protective condition. This, I think, is found in the mechanism of the process. I refer to Lecture V. (Medical Times and Gazette, November, 1867) for an illustration and description of the mechanism of labour in contraction of the pelvis from projection of the promontory. This projecting promontory forms the centre of rotation around which the head must rotate in order to enter the pelvic cavity. The side of the head applied to this point scarcely moves at all. The promontory catches the fœtal skull in the fronto-temporal region. If the coarctation be decided, the skull where it is caught bends in. All the onward movement is effected by the opposite or pubic side of the skull sweeping in a circle, which I have called "the curve of the false promontory," until the equator or greatest circumference has passed the plane of the brim, when the whole head slips into the cavity with a jerk. Now, injurious pressure is avoided on the pubic side by the smoothness and flatness of the inner surface of the pelvic brim, and by a gliding movement of the soft parts intervening between the head and the bony canal. Injurious pressure is avoided over the promontory by the yielding or moulding of the head. The temporal and parietal bones will bend in, even break. Children have been born alive after this bending or breaking. Sometimes a large cephalhæmatoma forms at the point of depression. In other cases the child perishes. The observation of these cases shows that the mother will bear with safety an amount of pressure which was sufficient to kill the child.

What follows ? This obvious corollary—that the mother will safely bear that lesser degree of pressure which is required to bring through a living child.

The operation, then, is justified in cases of contraction that admit of the passage of a living child. It is further justified in cases of contraction to a certain, though small, degree of contraction beyond this, which admits of the passage of a dead child. We have here, perhaps, carried the experiment to the verge of what is justifiable. Beyond this, there being no possibility of getting a child, live or dead, through the pelvis, it would of course be better not to go. And if all the conditions of the problem could be precisely ascertained beforehand, we should not go beyond this. But whilst calculating upon an average or standard head. we may encounter a head above the standard in size or hardness, and thus, in our endeavour to save the child, we may find ourselves in a difficulty. The extrication is by perforation. By lessening the head, it is brought within the capacity of the pelvis. This is, indeed, an acknowledgment of defeat ; it is beating a retreat. The justification, however, is that we accomplish in the end exactly that which those who reject the operation accomplish—namely, the safety of the mother. We have tried to do more—to save the child as well.

Is there any great difficulty or danger in perforating after turning? I believe not. The child's body is drawn well over to one side by an assistant, so as to facilitate the access of the operator's guiding fingers and the perforator to the child. The best place to perforate is in the occiput; but if that part be not easily struck, the perforator may be run up through the base of the skull. An opening into the cranium being made, the crotchet is passed into it, and the discharge of brain facilitated. Then, resuming traction on the trunk cautiously, the skull will probably collapse enough to pass easily. If not, the craniotomy forceps can be applied ; or, better still, the cephalotribe, to crush up the base of the skull. Now, under the postulates of the case, this late recourse to craniotomy must not be considered as a severe or hazardous addition to the risks of the woman. The turning has been performed early in labour—that is, before the liquor amnii has all drained away, whilst the child is still freely movable, and before there is any serious exhaustion of the mother. Under these circumstances the turning, especially if conducted, as it commonly may be, on the bi-polar principle, is not necessarily a long or a severe operation. If we fail in extraction, which is soon ascertained by observing that the head makes no advance, but that its globe expands broadly above the brim of the pelvis, perforation can be performed in good time. In short, the safety of the mother is secured by carrying through both operations whilst her strength is good. If exhaustion had set in, we should not have turned at all, but have proceeded to craniotomy in the first instance. To these considerations must be added the result of experience, which is to the effect that the retrieval by the secondary operation of craniotomy is successful.

What is the chance of saving the child? Dr. Churchill urges that "the life of the child is not secured, and its chance but little increased, even if our estimate of the pelvic diameters be accurate; for, if in turning with an ordinary-sized pelvis rather more than one-third of the children are lost, the mortality will be surely much increased if its diameter be reduced more than one-fourth." I will not stop now to press the preliminary objection I entertain to submit the decision of this or any other question in obstetric practice to *à priori* arguments drawn from statistics. It would not be difficult to prove that the statistics employed by Dr. Churchill are a confused heap of incongruous facts. and that rules to guide practice drawn from them must be stultified by endless fallacies. It is enough to state that the operation is not recommended by any one when the pelvis is contracted more than one-fourth—that is, below three inches—therefore the argument, statistical or other, is beside the question. I am not able to state or to estimate the proportion of children saved or lost under the operation. It is enough to justify the operation if we save a child now and then. I believe, however, that, exercising reasonable care in selection of cases and skill in execution, more than one-half of the children may be saved. And to save even one child out of twenty is something to set against the deliberate sacrifice of all.

Not assenting to the proposition that one child out of every three is lost by turning where there is no disproportion, I do not doubt that a much larger proportion would be lost under turning where the conjugate diameter of the pelvis is less than 3″. But, as I have said, the comparison is gratuitous. for no one, I believe, recommends turning in this latter case unless the child be premature. Experence here again corrects the foregone conclusion deduced from statistical reasoning. The risk to the child is considerably less than might be fairly anticipated. It is a matter of observation that *in cases of moderate contraction the funis is safer from compression than in cases of normal pelvis.* I have found the cord commonly fall into the side of the pelvis towards which the face looks, and there it is protected in the recess formed by the side of the jutting promontory; so that if the soft parts are sufficiently dilated not to compress the cord against the child's face, and if the labour can be completed under 5″, or even a little more, the child has a very good chance indeed. This proposition is especially true in the case of premature labour with contracted pelvis. In this case the child may, in the great majority of cases, be saved by turning. I have in this way saved many children who still survive to parents who would otherwise be childless. It deserves, I think, to be laid down as a rule in practice that *where the conjugate diameter measures from 2·75″ to 3″, delivery by turning should be the complement to the induction of labour at seven or eight months*—at least, I have acted on this rule with the happiest results.

Since the design of the proceeding is to save the child, it is obviously useless if the child is dead. How do we know when a child is dead? It is by no means easy to acquire certain knowledge of this fact. Nothing is more common than to read in clinical records "that the pulsations of the fœtal heart being no longer audible with the stethoscope," or, "the pulsation in the cord having ceased," or, "meconium having escaped," the death of the child was assumed, and the perforator was used without hesitation. I will not dispute that these are presumptive evidences of death, but I have too often experienced the satisfaction of seeing a child resuscitated after I had ceased to feel the pulsation in the cord, and after the free escape of meconium, to abandon the hope of saving the child without more certain evidence. This is found in great mobility and crackling of the cranial bones; the caput succedaneum falling into loose skin-folds; the coming away of epidermis and hairs.

So long as there is tonicity, rigidity, or firmness of the limbs, life is present; but flaccidity is not a certain sign of death. A sign of threatening imminent death is a twitching or convulsive movement of the leg held in your hand. This indicates an attempt at inspiration made to supplant the suspended placental circulation. When this is felt, it is a warning to accelerate delivery, and to excite aërial respiration.—*Medical Times and Gazette, Sept.* 5, 1868, *p.* 259.

97.—DESCRIPTION OF A WHALEBONE FILLET FOR FACILITATING LABOUR.

By Robert K. Debenham, Esq.

Many cases of lingering labour are left to the unassisted efforts of nature, when instrumental assistance would not only spare much suffering, but tend to the safety of the patient. The use of forceps in these cases, in private practice, usually brings discredit upon the practitioner; either he is said to lack patience, or to be clumsy, or "such assistance was never wanted on former occasions," and wise women, whose opinions have a mighty influence in the lying-in room, probably give their *fiat* against such interference Sending home for instruments is often a difficulty, and is sure to frighten the whole household, therefore many accoucheurs, especially if in country districts, carry a fillet or vectis in the pocket. Some objections are made to both of these instruments; yet something of the kind seems necessary. I had made for me, a year or two ago, by Ferguson of Giltspur-street, an instrument which, I think, has advantages over either. It is not formidable in appearance, is soft and pliant, and can be carried readily in the pocket. Its application is easy and painless, and there is no occasion to alarm the patient by bringing her to the bed's edge, or by any change of posture. Being thinner than forceps-blades, it occupies less space between the vagina and head, and by reason of its elasticity, it adapts itself better. Over the fillet it has the advantage of being introduced without force or scraping of the soft parts, yet it covers a far more extensive surface for the application of traction. The instrument consists of two long loops of whalebone interlaced, the free ends terminating in handles similar to forceps, but shorter, a peg being attached to lock them when required. The length of the loop is ten inches by three-quarters of an inch in width. In appearance it is a long straight forceps, with the blades interlaced. In adaptation it is like the fillet, being passed over the chin or occiput.

To apply it, the blades are passed together side by side beneath the head, like the lower blade of a forceps. Fixing the anterior handle with the left hand, the posterior is held in the right palm by the thumb and last two fingers; the other two fingers, being passed as high into the vagina as possible, are used to bend the blade almost to a semicircle to the hollow of the sacrum, then, by a turn of the wrist upwards, the blade is swept forwards around the upper surface of the head, rotating upon its extremity, and is brought into position opposite its fellow. The handles are now locked with a peg, and if kept well towards the perineum. there is no fear of slipping. I have used it in the ordinary position, and also over the occiput in a face presentation. It has the advantage of leaving no marks upon the child. I hope it may be the means of preventing many hours of suffering, in cases where there may be objections to the use of a more formidable-looking instrument.—*Clinical Lectures and Reports of the London Hospital*, 1867-8, *p.* 506.

98.—A CASE OF PARTIAL PLACENTA PRÆVIA.

By Dr. Robert Fowler, District Medical Officer of the East London Union.

[The patient was at her full time of the sixth child. She had been flooding severely before Dr. Fowler's arrival. He found her in a state of collapse—pale, cold, and almost pulseless.]

The presentation was so high that I could not make it out, until I had the whole hand in the vagina. The os was dilated to the size of the mouth of a wine-glass. *It was impossible without great and excessive violence to have got my hand through the os.* I plainly felt the edge of the placenta reaching to the level of the posterior lip of the os, and the posterior portion of the cervix was clearly thickened by the attachment of the spongy mass. In front of this latter I detected the fœtal head *covered with the membranes. There was not the least uterine pain.* Finding it impracticable to introduce my hand, I passed two fingers though the os, and *completely detached the placenta, as high as my fingers could reach, from its cervical attachment. Immediately I had effected this all hemorrhage ceased.* I then gave one scruple of powder of ergot in brandy-and-water, and covered the poor shivering thing with what wretched means were at hand. There being no food in the house save bread and tea, I had some of the latter made, and in about half an hour's time gave her therein another dose of the ergot. No pain followed. The woman had, however, wonderfully rallied, had become warm, talkative, and acquired a fair pulse. Although the membranes somewhat protruded through the os, I now determined, as there seemed no necessity to hasten or force labour, to *watch and see what nature could or would do.* As a matter of precaution, previously plugging the vagina, I left her in charge of the midwife, who had soon also to leave, being sent for to another case. I saw the patient again at five a.m. *There had been no hemorrhage and no pain.* She was doing well. To continue her brandy, tea, and sopped bread. At nine a.m., she obtained the necessary medical comforts. At two p.m. matters were still the same. As she complained of inability to make water, I removed the plug, *which was scarcely stained with sanguineous discharge.* She received four visits from the midwife during the day. At eleven p.m. I found her complaining of pain in the lower belly. This evidently depended on distended bladder, and was at once relieved by catheterism. The os was now more dilated and softer, and the head was just entering the brim. There was still no pains. In an hour after my visit to the patient pains came on, which the midwife on her arrival found well established. *Nature had ruptured the membranes*, the head was in the cavity, and completely through the os. *A still-born* *male child was naturally expelled, without the least return of hemorrhage* either before or after its birth, at between two and three a.m. of the 10th. *The bones of the child's head were separated, the whole body was discoloured, and the cuticle desquamating.* Unfortunately no notice was taken of the appearance of the placenta. The woman did perfectly well.—*Lancet, Aug.* 1, 1868, *p.* 145.

99.—ON HYSTERIA.

By D. DE BERDT HOVELL, Esq., Five Houses, Clapton.

[If any nervous symptom be owing to reflected irritation from the uterus it is properly named hysterical; any such symptom not originating in this way is misnamed hysterical.]

In a large number of cases the term hysterical is a misnomer. It would be better to describe as neurosis of the stomach a condition of that organ which is essentially atonic, but not necessarily complicated with a special relation to the uterus.

Long-continued observation in this class of cases has led me to the conclusion that not only the so-called hysterical vomiting, but hysteria itself, all the phenomena of the disease, and all the symptoms included in the hysterical category, do not originate with the uterus, but are caused simply by some source of irritation supervening upon a condition of *depressed nerve power from emotional causes:* that it is a nervous disease of general and not special origin. It may exist in conjunction with uterine irritation, or quite independently of such cause. The hystera, or uterus, is not necessary to its production, although that organ and its appendages may become implicated in the general disorder, but, I believe, by no means so frequently as is generally supposed.

It is a mistake to designate by a uterine name a disease which is not of uterine origin.—*Lancet, Aug.* 15, 1868, *p.* 219.

100.—ON HYSTERICAL VOMITING.

By Dr. HYDE SALTER, F.R.S., Senior Physician to the Charing Cross Hospital.

[There is, perhaps, hardly any symptom common to so many pathological states as vomiting. If we want to ascertain its meaning we must seek it in the antecedent and attendant circumstances of the case. The following case of vomiting is one of an interesting and curious kind—interesting from the peculiarity of its phenomena, and interesting in relation to diagnosis.]

Eliza T., aged nineteen, one of eight children, all living, and all healthy; her parents living and healthy, and residing at Bushey, in Herts; of fair complexion, with light hair and eyes, and rather thin, but not very: has with the exception of her present symptoms, always enjoyed good health. But all her life, as long as she can remember, she has suffered from the two classes of symptoms which now principally characterise her state—anomalous irregular pains in various parts of her body, and vomiting. They however suddenly acquired a much greater intensity when she began to menstruate, which was when she was about fourteen years of age, now five years ago. But as long as she can remember they have existed; back into her earliest childhood she recollects that she used to throw up her meals almost immediately after swallowing them. But the vomiting was not so persistent and invariable as it has been for the last five years, and she would have intervals of a fortnight in which she would vomit nothing. She always had to take aperient medicine, or her bowels were never moved. Her appetite was always good, and as soon as she had vomited one meal she wanted to eat another. She always suffered from thirst. She never felt, and never feels *sick*—she vomited without any warning. She never had pain in her stomach after eating, but down in the left groin, where the act of vomiting also gave pain. Until she menstruated she never vomited her supper—it was the only meal that she invariably retained; since that period she has thrown up her supper as well as other meals. She looked a healthy child, and had a colour; she was nervous and excitable, and easily made to laugh or cry.

Then, five years ago, with the appearance of menstruation, these symptoms, as I have said, received a sudden increase of severity—the vomiting became constant instead of occasional, and other symptoms showed themselves. She began to have headache, which has continued ever since; and her other pains became much more severe. These pains principally lie at the bottom of the back and lower part of the abdomen, and the genitals are the seat of the worst pain of all. The pains extend down the legs, with a numby, burning feeling. Two years ago she lost the use of her left arm every morning, so as to be unable to lift it to her head or to hold anything in her hand; as the day advanced this would go off; she had it up to within the last six months, and then it gradually left her. A twelvemonth ago she began to be troubled with a lump in her throat; she has it just before she vomits, and the vomiting seems to relieve it. Sometimes she has it without any vomiting at all; indeed, it has been at its worst when the sickness has temporarily ceased. It feels like a ball in the throat, as if it would choke her; and compels her to keep on swallowing in order to get her breath. The pain in the lower part of the back extends across the sacrum from hip to hip, and is of an aching character, accompanied with darting pain into the pudenda. The pain in the pudenda sometimes amounts to an agony, so that she can hardly tell how to bear it; it keeps her awake at night, and often makes her cry. It is a sharp shooting pain—it comes, and is gone; but just before she becomes unwell the paroxysms are so frequent that the pain is almost constant. The parts are tender, and sometimes it seems when she walks as if something pricks her. She has an almost constant desire to pass water, and cannot hold it for long; if she attempts to do so, it puts her in great pain. She cannot tell how many times she passes it in the day, and in the night she often has to get up two or three times in order to relieve herself. As soon as she has passed water she seems to want to pass more. The water is very pale—sometimes quite white, like spring water,—and very abundant. But at the monthly period, although the want to pass water is more urgent than at any other time, she passes less than usual. At this period it gives her great pain to have her bowels moved, but not at other times; she then also is troubled with piles, which vanish when menstruation ceases. Her headache is frontal: the worst time for it is the afternoon, as soon as she has had her dinner. This is much worse also at the monthly period.

For the last twelvemonth she does not think she has passed a day without vomiting, with the exception of three occasions since she has been in the hospital. As a rule, she has vomited every meal she has swallowed; it comes up immediately, even before she has finished eating. She sometimes vomits part, and then finishes the meal afterwards. Even the vomiting does not for a moment interfere with her appetite; she always feels hungry, even craving. She is equally prone to vomit one meal as another; but while the breakfast and the tea come up without any effort at all, the dinner is often brought up with difficulty and violent retching. In quantity the vomited matters seem generally quite as much as she swallows, and sometimes more. The food comes up unchanged, just as she swallows it. As a rule it comes up directly, and if she does not vomit at once she does not vomit at all; on some rare occasions, however, food has remained in her stomach as long as twenty minutes, and has then come up. At her breakfast and tea the return of the food hardly seems to deserve the name of *vomiting;* it seems simply to rise into her mouth. One very curious thing is that she cannot be sick if a stranger is present; she is obliged to go away in order for the food to come up. It occasions her great discomfort, and "seems to want to come up," but it does not actually rise to her mouth till she goes away; she thinks it would eventually, but would take a much longer time. As soon as she goes away, or the person goes away, it is up in her mouth at once, and the thing is over. Any member of her own family, or anyone she is accustomed to, has not the same influence: it comes up as well in the presence of anyone she is "used to" as if nobody was present. Fluids seem to come up with much greater facility than solids, and that is the explanation of the much greater ease with which the breakfast and tea are discharged than the dinner. If she takes broth for her dinner, it comes up as easily as her breakfast and tea. If she takes her pill with some water, the water immediately comes up, but not the pill; if she takes it with a scrap of bread, nothing comes up.

She came into the hospital exactly six weeks ago to-day, and she has vomited every day except on three occasions: one was a month ago, from Saturday morning to Monday evening; the second a fortnight ago, from Friday morning till the following Tuesday evening; and the third last week. On all these occasions everything was kept down. She was not menstruous at either time. During these times she felt much worse—more pain towards the groin and genitals, and the bowels full and hard. On the first of these occasions she had just begun to take some pills containing a grain of oxalate of cerium, a twelfth of a grain of morphia, and three grains of extract of hyoscyamus. She began these pills on the Friday, and on the Saturday morning her stomach ceased to return the food. On the Monday evening, however, the sickness reappeared, so that if the pills had any efficacy they soon lost it. On the second occasion, which was longer—nearly five clear days,—there was nothing apparently to account for the remission. On the third occasion the sickness suddenly and entirely ceased for three days, on my colleague, Dr. Pollock, who was that day seeing my patients for me, giving her teaspoonful-doses of camphor mixture every hour: it seemed to act like a charm, and from the first dose the sickness ceased. Three days afterwards she became menstruous, and the sickness immediately returned. The camphor water was continued, but it had now lost all efficacy.

And yet, in spite of the retention of so little food, this young woman does not look ill; making allowance for her fair complexion, I do not think she looks even delicate, or that she would strike one as having anything the matter with her. She is not by any means emaciated; and it is quite certain that, in spite of appearances and her own impressions, she must retain a good deal of what she swallows. She has certainly gained flesh since she has been in the hospital, and has more colour.

[Dr. Salter passes on to consider the various causes of vomiting which must pass under mental review in forming a diagnosis of such a case as the one under consideration.]

In determining whether any symptom is hysterical, we are often guided by the existence or not of other signs of hysteria —by signs which tell us whether the individual is one in whom hysterical symptoms are likely to occur. These presumptive circumstances in favour of hysteria are in this case very strong. In the first place, we have evidence of hysterical tendency. The girl was nervous and excitable as a child, and subject to hysterical paroxysms both in childhood and recently. Her manner and aspect are characteristically what are called hysterical: she speaks to you with averted eyes, and never looks you full in the face; she is nervous, fidgety, twitching, and restless; she has a "hang-dog," sullen, glum expression, and an "injured" manner. Then she has those two characteristic symptoms of hysteria, the passage of what is called hysterical water, and the lump in the throat. The topography also of most of her symptoms, except the vomiting, is such as we see in hysteria: they are almost all of them pelvic—the pain in the lower part of the back, in the genitals, legs, and groin, and the painful micturition. It is extremely common for morbid sensations having an hysterical origin to group themselves in the neighbourhood of the generative organs; and in any case of supposed hysteria such a localisation would, to my mind, be a strong presumption in favour of such a diagnosis.

Then, again, the aggravation of the symptoms at each monthly period points to the same conclusion. The headache is then worse, the paroxysms of pain in the genitals are then almost constant, the irritability of the bladder is greater, and pain is then felt, and only then, on passing her motions. The sudden aggravation of the symptoms at the establishment of the reproductive function is, in relation to diagnosis, a congruous circumstance: she never vomited her supper till she menstruated; then the vomiting became constant instead of occasional, then the headaches commenced, and then the other pains in sacrum, genitals, legs, &c., became suddenly worse.

But we have, besides all this presumptive evidence, specific and positive proof of the vomiting itself being hysterical. In the first place it was evidently nervous vomiting—that is, it was under nervous influence, for if a stranger was present it could not take place; then, again, it was worse at each monthly period, and, if stopped, always recurred at that time; then, again, as I have already mentioned, it became more marked and constant when menstruation was first established. It had besides evidently a vicarious relation with her other hysterical symptoms; when she does not vomit, the pain in the genitals is worse and the lump in the throat;—that is, if the hysterical state does not manifest itself in one way it does in another. Lastly, the character of the vomiting itself is such as we see in nervous vomiting, and therefore such as is compatible with an hysterical interpretation of it; and not such as we see in primary stomach vomiting: there is no nausea, no warning of any kind, she never felt and never feels *sick*—the stomach simply empties itself.

Whether the loss of power in the left arm, recurring every morning for so long a time, was a form of hysterical paralysis, or whether it was that peculiar form of loss of power in the hand and arm in the morning which I have seen in many females, and which I believe to be rheumatic, I will not say, and therefore I will not give it any weight as a symptom.

It may be objected that the vomiting could not be hysterical because it occurred habitually before the functions of the uterus were established—back into her early childhood, as long as she can remember, the girl says that she was troubled with this symptom. But this objection I think amounts to little more than a proof that the word *hysteria* is a bad word for that which we mean to designate by it. It is quite certain that children may show all the symptoms of what we call hysteria long before menstruation commences; and when I call this case a case of hysterical vomiting, I mean that the vomiting is a symptom of that morbid irritability that we so often see in females, that depends on the impressibility and mobility of their nervous organisation, and is oftener set wrong by derangement of the sexual functions than by any other cause. Hysteria depends on type of nervous organisation, and not on the possession, or the disturbed function, of a uterus.

A word about the thirst. The girl says she was always thirsty, and is so still. Has this symptom any independent meaning of value? I think none at all. I think it simply points to the vomiting, and simply depends upon it. The thirst of vomiting is something of the same nature as the thirst of hemorrhage, except that in the one case the thirst depends on a demand for water to make up for the circulating fluid that has been lost, and in the other on the fact that the vomiting prevents the water constantly demanded by the blood from ever reaching it in sufficient quantity. The state of a person who always vomits fluid the moment it is swallowed is very much that of a person who never drinks. Wherever there is constant and immediate vomiting there is thirst.

I may here mention a case that occurred to me not long ago in private practice, presenting many points of resemblance to the one I have been commenting on, and evidently belonging to the same class.

C. B., aged 17, a young lady living in Essex, called on me the 4th of last October. She was then rather thin, although she had formerly been stout. She stated that she was regular, and was quite well up to the end of June, when she began to vomit. The vomiting then went off for about three weeks, then came on again, and has continued ever since. Of this vomiting she gave me the following account. It comes on quite suddenly, without any warning; but sometimes is preceded by "windy spasms," with eructation. She never vomits without having taken food. There is no pain or tenderness in the epigastrium, but there is pain in the right hypochondrium and in the chest; the pain in the right hypochondrium is worse when she is fatigued—that in the chest just after vomiting. There is no nausea, but the food suddenly comes up; without any distinct act of vomiting at all, it suddenly appears in the mouth. As she is sitting at her meals, before she has finished, she has to rise and run away; sometimes the food has not been swallowed a minute. It is always unchanged. Some things are never vomited, and the choice is most capricious. The things that have been best kept on the stomach are fruit (even nuts), oysters, bran biscuits (a sort of gingerbread nuts), toast, and tea. The things that are the most invariably returned are meat and milk; the milk is thrown up at once. Bread is now at once returned, especially for the last four days. Pastry was kept down for some time, but now that is returned. Vegetables are returned. Wine, brandy-and-water, and beer return immediately. She is always hungry; bowels disposed to be confined. She is very nervous and excitable, and three weeks ago had hysterical paroxysms, from which also she suffered when she was a child. The following additional facts were communicated to me by her medical attendant. "The vomiting is worse towards the latter part of the day. Her sister states (in strict confidence) that what she steals (that is, takes on the sly) is more frequently retained than anything else. The substances the most easily retained are what one would call indigestible. I have witnessed one or two attacks of the vomiting. She would be sitting at table at her meal, get up, and go out of the room, and the food would be found almost unchanged. There would be but little retching; the food seemed to come up as easily as in an infant. As fruits, whether pulpy or oily, are the substances most easily retained, I have ordered her to eat freely of them." I was subsequently informed by the same gentleman that she was a young lady who habitually gave way to the most violent and uncontrollable outbursts of emotion, so that the peace of her family was quite compromised by them.

The chief points which this case and that of Eliza T. have in common are—the evidence of nervous and excitable temperament, and of liability to hysterical paroxysms; the absence of all symptoms of dyspepsia or disease of the stomach; constant hunger; the ease and absence of effort with which the food rises into the mouth; that the vomiting comes on without any warning; that it is unaccompanied by nausea; that it never occurs except immediately on taking food; and that the tendency of food to cause vomiting is entirely independent of its digestibility.

I suppose you will hardly be contented if I dismiss you without saying something about the treatment of such cases as these. But, in truth, I have little to tell you, except this—that you will find them among the most unsatisfactory cases, in the way of treatment, of any that will come under your observation. There is, indeed, but little to be done for them. On one point you may make up your minds: it is of no use to treat the stomach. I believe in most of these cases there is nothing wrong with the stomach whatever. What you have to treat is a certain condition of the nervous system. *You must cure the hysteria.* Now you know how difficult a problem that is. As long as the hysteria remains, so long will its particular manifestation, whatever it may be, and whatever organ it may effect, remain also. In the case of Eliza T., we employed every remedy that we could think of to allay the irritability of the stomach, but without any but the most doubtful and evanescent effect. We gave her all kinds of sedatives—opium in various forms, hyoscyamus, belladonna, conium, hydrocyanic acid; we tried creosote, bismuth, oxalate of cerium; valerian, ammonia, ether, assafœtida; shower-bath, iron, quinine—in fact, we exhausted all our resources, both in the treatment of the symptom and of the essential morbid state,—and all in vain. I do not mean to say that all treatment in such cases is necessarily inoperative, but that in order to be operative it must appeal to the state of the nervous system, and that it will only control the sickness in so far as it controls the hysteria. There is one event, however. which, if it could be brought to bear upon either of these cases, would, I believe, at once stop the sickness, and that is the induction of maternity. When the subjects of such symptoms marry, all vomiting ceases; or rather the particular kind of vomiting they have suffered from is exchanged for another and more temporary and tractable kind of sickness.—*Lancet, July* 4 *and* 11, 1868, *pp.* 1 *and* 37.

101.—A CASE OF VAGINAL ATRESIA AND ABSENCE OF MENSTRUATION CURED BY THE USE OF TANGLE-TENTS.

By Dr. W. Murray, Physician to the Newcastle-upon-Tyne Dispensary.

Miss A. B. C., a young lady. aged 27, slightly marked with the pits of small-pox, consulted me fifteen months ago. She complained of a severe pain in the hypogastric region, and radiating pains in the back, loins, and lower extremities. She had suffered in this way for some years, and she said her pains were periodically increased at intervals of five or six weeks. On further investigation, it appeared she had menstruated only once or twice in her life, and that the show scarcely amounted to a teaspoonful on each occasion. On proceeding to examine the uterine organs, I was surprised to discover that the vagina was a mere *cul-de-sac*, an inch deep, terminating in a conical depression. The walls of the *cul-de-sac* were made up of cicatricial tissue; and at the fundus of the depression in which the *cul-de-sac* terminated, I detected a minute opening through which a No. 1 elastic bougie would scarcely pass. In order to make a further diagnosis of the case, I determined to introduce a tangle-tent into the minute orifice I had discovered, and then to pass the uterine sound through it. This was done; and on passing the sound, I introduced my finger into the rectum and felt the point of the instrument projecting through the solid barrier in the vagina into a cavity above. Beyond this upper part of the vagina I could feel a round body very like the uterus in size and shape. As the dilatation had caused some pain, and as no immediate result followed it, the patient and her friends declined further interference at this time, and I did not see her again until August last. I then found her suffering as before, and very much altered in appearance; her countenance was haggard, her manner hysterical, and her nutrition impaired by constant vomiting. She was now prepared to go through any kind of treatment to obtain relief.

Having obtained the assistance of Mr. J. B. Fife, whose advice and surgical skill proved invaluable throughout the whole procedure, I dilated the small opening running through the closed portion of the vagina, until it admitted the tip of the little finger. At this point an accident occurred, from the string attached to the tent having given way, leaving the tent firmly impacted in the newly formed canal, where it remained for about thirty hours, when Mr. Fife removed it by making a slight notch in the canal on each side of it. When the tent was removed, the finger could be freely passed through the opening it had formed into the upper part of the vagina, and there we found a somewhat contracted but perfectly formed cervix uteri. The dilatation was now continued freely by sponge-tents until a large speculum could be passed into the vagina. The uterine sound was then passed, and a very minute os uteri was discovered by it. The sound, when twisted a little to the right, could be introduced an inch deep into the cervix uteri. This enabled us to secure the introduction of a small softened tangle-tent in the direction indicated by the sound, by a little careful manipulation, the tent slipped almost overhead into the uterus.

When this tent was withdrawn the next day, a very free passage into the uterus remained. Both the vagina and the uterus now showed an obstinate disposition to contract and assume their former condition, so that we were compelled to incise the cervix uteri freely with Greenhalgh's hysterotome, and to keep both the canal of the cervix and the vagina constantly dilated for some days.

Exactly one month from the time the hysterotome was used, [illegible] menstrual flow appeared and continued for three days. In every respect the period and flow were normal. From this time the patient improved rapidly in general health. At the end of another month, finding the os uteri slightly contracted, I introduced a tent for a few hours, and gave the patient two doses of aloes. After this, the menstruation again took place, but it was unfortunately stopped by a severe fright received by the young lady during the following night. From this time all went on well till another month elapsed; then she began to suffer pain, to vomit, and to assume a hysterical manner, but after waiting patiently for a few days, relief of all these symptoms was obtained by the reappearance of menstruation for the third time. On this occasion, it was full, free, painless, lasted five days, and left the patient quite well, without ache or pain. Six or eight menstrual periods have now occurred; for the most part they have been very satisfactory, and on each occasion they have been followed by great improvement of the patient's health.

The chief point of interest in this case is the entire abeyance of the menstrual functions of the uterus during a period of a least fourteen years from the age of puberty. The entire want of action previous to the dilatation of the parts was proved by the total absence of retained menstrual fluid. I might add, that it is quite clear the closure of the vagina was produced by the extension of small-pox into the vulva, and subsequent ulceration of the walls of the vagina. The case strongly commends the use of dilatation instead of cutting in cases of closure of mucous canals of all kinds; and where no opening exists to permit of this, I should introduce a fine trocar, and then leave a tangle-tent in its place as a commencement of the dilating process.—*British Medical Journal, July* 4, 1868, *p.* 5.

102.—A NEW UTERINE DOUCHE.

By Dr. HERMANN BEIGEL, Physician to the Metropolitan Free Hospital.

The application of the syringe is so extensive in all branches of Medicine, Surgery, and natural philosophy, and the apparatus hitherto in use for that purpose so deficient, that, in hospital work, as well as in private practice and in scientific researches, I have very often felt the want of a good instrument. The hand-ball first constructed by Dr. Bergson, and afterwards improved by Dr. Andrew Clark, which I have found of great service in my researches on the inhalation of atomised fluid, and which has rendered available Dr. Richardson's excellent and very important invention of local anæsthesia, seemed to me the best instrument for the motor power required for a syringe.

In some departments in medicine, the success of the case depends very often on the instrument applied. In chronic metritis, for instance, and in other diseases of the female genito-urinary organs, all our efforts may be frustrated if we cannot place in the hands of our patient an instrument which may be easily handled and readily applied, refilled, cleaned, &c.

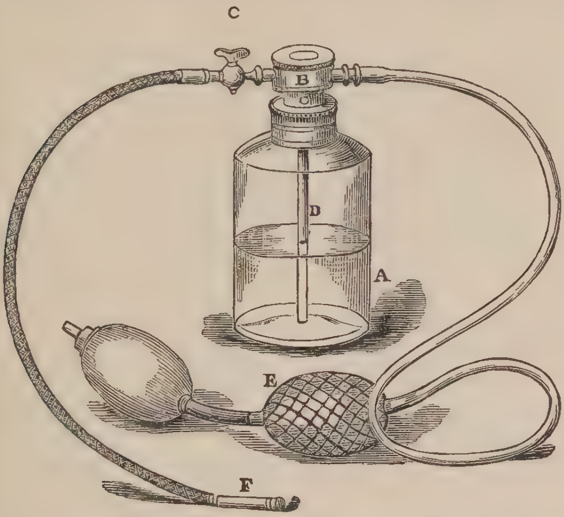
The uterine douches hitherto in use may thus be classified :—

1. Instruments acting by direct pressure on the liquid to be injected, as the common syringe. Ancient as this instrument is, and simple in its construction, yet, in spite of its simplicity, it possesses great disadvantages. Change of temperature and frequent use have great influence over the proper adjustment of the piston to the tube, which adjustment is indispensable for good action. The slightest looseness makes the fluid escape above the piston, and little or nothing is injected. Another inconvenience is the small size of these instruments, and the necessity of requiring a second person for some injections—enema, for instance. The simple syringe has been modified by C. Mayer and others, in order to remove some of the defects just mentioned; but these modifications are expensive, complicated, and are still more liable to get out of order than the common syringe.

2. Apparatus working by means of exhaustion. Some of these work well, but labour under the great inconvenience of not being able to produce a continuous jet, which is often very essential; besides, the means of increasing and diminishing the force of the jet is very limited.

3. Apparatus acting as siphons, as does Scanzoni's well-known uterine douche, consisting of an india-rubber tube and a metal weight, in order to keep the tube in the vessel containing the fluid to be injected. Here the jet is thrown out in a continuous stream, and its force may be varied by raising or lowering the vessels. This arrangement, simple as it is, labours under the disadvantage of requiring different heights for regulating its force; and even when properly adjusted, a slight traction upon the tube may easily upset the vessel and throw the fluid over the patient's head.

All defects of these apparatus have been, I think, avoided in the instrument represented in the following woodcut. Its mode of operation needs scarcely any explanation. A is the vessel containing the fluid to be injected; it is capable of holding about two pints, but may be made of any capacity required. B is the top, which can easily be adjusted to the bottle by a very simple arrangement at C. This top is on one side connected to the handball E, the action of which compresses the air above the fluid in the vessel; on the other side of the top projects the tube F, having a stopcock at G. A few movements of the handball suffice to compress the air sufficiently to cause the fluid to escape by the tube D as soon as the stopcock becomes opened. The regulation of the force of the jet, which is continuous, is easily effected by the handball. The apparatus, as manufactured by Messrs. Mayer and Meltzer, of Great Portland-street, is very portable, can be cleaned with the greatest ease, and works with the utmost perfection. It may as well be applied for uterine purposes as for the rectum, eyes, pharynx, nose, &c., as for cleansing wounds and other surgical requirements. A smaller form of the apparatus answers well for microscopic injections, and, in fact, will be of great service whatever injection or syringing is required.—*Medical Times and Gazette, July 11, 1868, p. 31.*



103.—ON THE LOCAL APPLICATION OF CARBOLIC ACID IN UTERINE DISEASE.

By Dr. Lloyd Roberts, Surgeon to St. Mary's Hospital for Women and Children, Manchester.

[The cases in which Dr. Roberts recommends the application of carbolic acid are precisely those in which nitrate of silver is of use. These are, ulceration of the os and cervix uteri, with or without hypertrophy; chronic inflammation of the uterus, and cervix, with excoriation; cases of follicular disease of the cervical canal. Its mode of application is as follows:]

For its application in ulcerative disease, the only requisites are a speculum, uterine forceps, and lint. The surface of the ulcer, first wiped clean with lint, is then touched with another piece of lint saturated with the acid, previously liquefied by the addition of a little water (a few drops to 3 or 4 oz. of acid). The surface of the sore may be gently dried with another piece of lint, which will serve also to absorb any superfluous acid that may have drained into the speculum. Care should be taken not to touch the vaginal mucous membrane with the acid, as it not only excoriates but causes some pain for several hours. For the introduction of the acid into the cervical canal I have used a camel's-hair pencil, or, when this could not be introduced, a gum elastic catheter or bougie dipped into the acid, the canal having been first cleansed by the injection of water, or by other means, such as the introduction of a pledget of lint, when the os uteri is sufficiently open for the purpose. In cases of ulceration occurring in child-bearing women it is singular to what an extent the cervical canal becomes patent. A No. 14 bougie can often be passed into it with ease. The application of the acid may be repeated once or twice a week, according to circumstances. In addition, I have commonly used a lotion composed of ʒj. to ʒij of the acid, and ℥j. of glycerine, to Oj. of water, which acts both as a healer and a disinfectant.

The advantages which carbolic acid appears to me to possess in cases of uterine disease are the following:—

As *a caustic* it is especially useful, occupying as it does in escharotic power a position intermediate between the milder nitrate of silver and the more powerful corrosive caustics, potassa fusa, the mineral acids, acid nitrate of mercury, &c. More energetic than the first-named salt, it is at the same time free from the danger to the neighbouring structures which attend the use of the more potent caustics. Although its action does not penetrate below the diseased surface, it possesses in equal degree with the stronger caustics the property of changing the vitality of the tissues, and produces rapid cicatrization, dissipates the inflammation and hypertrophy, and relieves pain.

By its disinfectant action it destroys the offensive odour of purulent and other discharges, and acts beneficially upon the unhealthy, lax, and discharging vaginal mucous membrane.—*Practitioner, Oct.* 1868, *p.* 230.

104.—THE TREATMENT OF SO-CALLED "IRRITABLE UTERUS."

By Dr. Graily Hewitt, Professor of Midwifery and Diseases of Women, University College.

[Nothing is more painful than the condition of a patient with irritable uterus. On examination, the womb is found exquisitely tender; but it may be perfectly healthy otherwise, or it may be ulcerated, or congested generally or in one spot. The exalted sensibility is evidence of a general rather than a local disorder. The above is the generally received opinion of the nature of the disease, and is pre-eminently that of Gooch.]

Further experience, together with a careful consideration of the whole matter, has led me to a more firm, and indeed a very decided opinion on the subject, and now I avow my conviction that the "irritable uterus" is nothing more nor less than retroflexion of the uterus of a marked form, that the symptoms present in the cases described by Gooch were due to the flexion in question, and that the symptoms so dependent can be made to disappear, and the patient be restored to comparative—often to perfect—health, by remedying the defect, and by restoring the uterus to its proper shape.

The evidence I have to offer, that the symptoms supposed to be due to the "irritable" uterus arise from retroflexion of the organ, is of the following kind. I have had several, I may say as many as fifty cases, under my notice at various times, in which these symptoms in various degrees of intensity have been present; the descriptions given by Gooch of some of the cases might have stood for descriptions of the cases observed by myself, but in all of my cases I have detected retroflexion of the uterus, the organ having the form of a retort, in various degrees. On the other hand, having now had a very considerable experience of uterine disease, I can say with confidence that I do not recollect to have met with a single instance presenting typical irritable uterus symptoms *un*accompanied by the kind of alteration now alluded to. I have met with cases, it is true, where the uterus was tender to the touch, and also cases where, in addition to this, locomotion was painful, but never in the degree so graphically described by Dr. Gooch. I know not how more conclusively to prove the truth of the ideas which I have on the matter, than by the foregoing argument.

Why, it may be asked, does retroflexion of the uterus give rise to such excessive irritability of the organ? The answer to this will be, I conceive, as follows:—The flexion produces, mechanically, engorgement of the uterus, interferes with the circulation within it, and compresses the nerves which course through its tissues. And the stretching and dragging of the peritoneum involved cannot be unimportant. It generally happens in these cases that a cursory digital examination gives an incorrect idea as to the locality of the tenderness, for when the examination is done gently it will, as a rule, be found that the cervix is hardly, if at all, sensitive, while the slightest touch on the fundus of the uterus, which is now low down and displaced, and can be felt behind the vagina, gives the acutest pain to the patient, thus showing that the sensitiveness is localized. A rough push of the finger against the *os* gives pain because the whole uterus thereby undergoes concussion.

The importance of the flexion in those cases of irritable uterus where its *existence* has been actually recognised, has been greatly underrated, in consequence, as I believe, of the doctrine and teaching of Gooch. And as the observations and remarks of Dr. Ferguson have only tended to confirm Dr. Gooch's view of the matter, it is not surprising to find, that even at the present day there is an indisposition to believe in the existence of a structural change of the organ in case of irritable uterus.

I am far from denying the importance of structural uterine lesions. But I hold that in a very large number of cases these structural changes are themselves the result of accidental alterations in the form of the uterus. Of this class of cases retroflexion of the uterus is a most marked instance. Here we have a distinct, palpable change in the outline of the uterus, resulting from a fall, a strain, or a soft condition of the organ, predisposing it to become easily changed in its form on application of a slight force. The organ becomes congested, painful, tender; motion aggravates the displacement, the pain increases, and the uterus gradually hardens, preserving the vicious shape it has thus accidentally acquired, and leaving the patient a sufferer, often—if unrelieved—for years.

Is it surprising, if such be the real state of the case, that applications of a caustic nature to the *os uteri* prove quite unavailing in removing the suffering? or is it to be wondered at that the uterus, if left in its flexed state, remains a source of perpetual discomfort to the patient?

A priori reasoning on the matter, however, would be comparatively unconvincing did it stand alone. But that what has been now put forward conveys the truth is further supported by the fact which remains to be stated, that having treated many such cases on the principle alone of reducing the flexion, I have found such treatment almost universally successful in removing the symptoms.

Of late years the question of the treatment of retroflexion of the uterus has received much attention, and, a confessedly difficult disease to cure when in the chronic stage, much has been and can be done to remedy it. The most satisfactory method of treatment, on the whole, consists in the application of pressure behind the cervix uteri, maintaining the cul-de-sac of the vagina behind the cervix in a high position in the pelvis. A modification of Hodge's pessary answers this purpose very completely. The one used by myself consists of an oval-shaped ring, the length of which varies according to the case, having a gentle curve adapted to that of the vagina. The upper part of the ring prevents the descent of the fundus backwards, and by degrees the flexion is rectified. In some cases a short-stem pessary can be worn in the uterine canal, and retained there by attaching it to the vaginal ring; but on the whole the other method is more generally applicable.

The patient suffering from "irritable uterus" then need not be consigned to the sofa for an indefinite period. By the use of a ring-pessary well adjusted, locomotion is rendered easy and painless in by far the majority of cases. The tender, irritable state of the uterus subsides gradually, and we may hope even in the worst cases to restore the shape of the organ more or less completely. The uterine sound may be occasionally used to bend the uterus, but in the worst cases it cannot be tolerated at first. Maintenance of the horizontal posture is necessary in the worst cases, during the first part of the time the patient is undergoing treatment.—*Practitioner*, *Aug.* 1868, *p.* 89.

105.—CASE OF MAMMARY ABSCESS TREATED BY LISTER'S METHOD.

By Dr. George H. Williams, Rhyl.

Mrs. J., aged 27, a fine healthy woman, was confined four months ago of her first child; although it was a face presentation she did well; she suffered much from excoriated nipples while suckling. About a month ago she imprudently had a morning's washing, and stood in thin slippers; this brought on pain and throbbing in the left breast, and, in spite of active treatment, a large abscess formed a little above the nipple.

On Thursday, April 23rd, 1868, I opened it according to Mr. Lister's directions. My friend Mr. Price Roberts, who had not often seen this treatment, was present, and held the soaked rag. After pressing out every drop of pus, which was fully a large tablespoonful in quantity, the putty was immediately applied; the next day I dressed it, under the same process, when, to our surprise, there was not a drop of discharge on the dressings. On the Sunday following, the cavity had filled up and healed over, and the whole breast presented as soft and healthy an appearance as the other. It has continued so, the secretion of milk reappearing at the nipple, which the child takes readily. Under ordinary treatment with unguents, poultices, &c., it would have taken a fortnight or three weeks in healing. I have under similar treatment at present a case of sinus beneath the instep, communicating with the fourth metatarsal bone, of eighteen months duration. I shall relate the results in a future number.—*British Medical Journal*, *June* 6, 1868, *p.* 556.

106.—OVARIAN NEURALGIA TREATED BY HYDROCHLORATE OF AMMONIA AND TINCTURE OF ACONITE.

By Dr. J. Waring-Curran.

Whilst acute inflammation of the substance of the unimpregnated ovary is of rare occurrence, having never myself, in either hospital or private practice, met with what one would be led to believe a genuine or an established case, thus believing that the *ovarites* of writers on the subject is in character *chronic*, or perhaps in a few rare cases *sub-acute*, yet *neuralgia* of the *ovary* is far from uncommon. By neuralgia of this body, I mean that class of ovarian disturbance which Dr. Churchill has described under the nomenclature of "*ovarian irritation*," and to that which Dr. West applies the simpler designation of "*ovarian-pain*," to me *ovarian neuralgia* appears a preferable and more correct term. Clinical observation has taught that the disease is independent of any local lesion, and more remediable by constitutional than any other method of treatment. My object here is not to enter into those cases of *ovarian neuralgia* dependent on defective moral training, and where a strictly moral treatment is to be enforced, and undue connubial excitement checked, but those cases where the patients' sufferings are constant and severe, when there is no hysterical temperament, and no obvious symptoms of imprudence or immorality. My object, also, as briefly as possible, is to enter upon the treatment of such cases, and to illustrate, by the history of the six following, the great benefit to be derived from the muriate of ammonia and tincture of aconite in the treatment of this affection, when leeching, purgation, antispasmodics, vesicants, sedatives, internally administered and locally applied, had signally failed.

Case 1.—R. A., aged 27, of sedentary habits and chlorotic appearance, unmarried, sought advice for a severe and constant pain suffered in the left iliac fossa, had been under another medical gentleman for ten days, from whose treatment she stated she had experienced no benefit. The pain was dull and aching in character, occasionally passing along the anterior surface and inner side of the thigh; has not slept for a week; the appetite is impaired, but the secretions are all healthy; the tongue has a characteristic nervous coating, and the pulse is quick; there is no hysteria. Upon examination, I find a fullness in the left iliac region, with tenderness. I ordered the application of liniment, belladonna with chloroform, over the seat of pain; prescribed a saline aperient mixture, containing tincture of belladonna and a sedative draught at bed-time. For three days this treatment was persevered in, but there was no relief to the symptoms; the only ease experienced was when the patient lay flat on the face. I then applied a blister over the seat of mischief, gave opium, cannabis indicis, and camphor, in the form of pill, and tincture of conium in mixture. The following day there was an aggravation of the symptoms; the patient had spent a restless night, and the relatives became anxious. Upon this I prescribed an eight-ounce mixture, containing two drachms of the muriate of ammonia, with five-drop doses of tincture of aconite. The combination seemed to act magically; before the bottle was finished the pain was gone. Sulphate of iron and quinine was afterwards given, and four months have now elapsed without any return of the complaint.

Case 2.—A. L., aged 19 years, single, of a full habit, and hitherto healthy, became affected with a violent pain in the left groin, for which immediate advice was required, as the woman in attendance dreaded the existence of a hernia. On being visited I found the pulse high, and the usual symptoms of inflammatory fever. She had suffered severely four months previously to being visited, and had passed no water from the commencement of the attack; vomiting was a constant and distressing symptom. On examination I found slight swelling on the left side, with intense pain on manipulation; the tenderness extended below Poupart's ligament. Having satisfied myself that there was no rupture, I ordered turpentine stupes to be applied, and directed her to have a warm hip-bath, and a mercurial aperient. The following day, as there was no progress towards amendment, I applied six leeches over the site of pain. This gave temporary relief, but towards evening the pain became if anything more severe. I found her, on being visited, on her hands and feet out of bed, apparently suffering most acutely. I prescribed her a draught containing twenty drops of cannabis, and immediately placed her on the muriate of ammonia and aconite mixture. The ensuing morning she expressed herself considerably relieved, but the tenderness remained, at times the pain recurred, producing vomiting when it did so. The patient got on remarkably well until the menstrual period arrived, when the same state of things occurred over again; but under the muriate of ammonia and aconite much was done to arrest the disease. She has had a menstrual period since without any recurrence of the pain.

Case 3.—A. R. F., aged 22 years, married for the last 14 months, has long suffered from chronic ovarian pain, increased during the menstrual period. Has taken, to use her own words, "no end of medicine," and has been under the treatment of various physicians, "who all told her the same thing." I prescribed at once the muriate of ammonia and aconite; two bottles in the course of six days entirely removed the pain. Six weeks have elapsed, a menstruation passed with little pain, and at the present time (July 14) I learn from the woman, who came with another patient. that she has entirely recovered, and has had no return of the pain since she finished the last mixture.

Case 4.—J. L., married, aged 40 years, has suffered from ovarian neuralgia for a number of years. At times the pain is unendurable; during its existence there is fulness and tenderness over its site Having been under treatment for an hepatic lesion, and obtained the above information in the history of her case, I told her, when the ovarian neuralgia returned, to apply, and I should prescribe for its relief. She accordingly did so in the course of time, and from the muriate of ammonia and aconite she obtains almost immediate ease.

Case 5.—G., about 25 years of age, single, has suffered from the time of her first menstruation with ovarian pain, causing frequent and painful micturition, with vomiting. Gave her the muriate, and had the satisfaction of hearing her express that she obtained instantaneous relief after its administration. Has suffered from subsequent attacks, which invariably yield to the medicines advocated.

Case 6 is furnished to me by a professional relative. It is that of a woman, aged 30 years, who has borne three children, and has laboured under ovarian suffering for a term of years. She has been a constant patient of my informant. He had "exhausted the Pharmacopœia," as stated, but with no benefit. Upon the exhibition of the muriate and aconite, the symptoms directly yielded to treatment, and the woman was relieved from much periodic suffering, and the physician re-established the confidence hitherto placed in him.

Although I am at a loss to account for the inexplicable property possessed by the muriate of ammonia in curing ovarian neuralgia, I can unquestionably vouch for its efficacy in the same way as the French and German authors first bore out its high character and undeniable specific action as a stimulant in mucous fevers, when the inflammatory symptoms have subsided. —*Medical Press and Circular, Aug.* 19, 1868, *p.* 162.

107.—TWO CASES OF INCONTINENCE OF URINE FROM EARLIEST CHILDHOOD, CURED BY MECHANICAL DILATATION.

Under the care of Dr. Braxton Hicks, at Guy's Hospital.

A cause of incontinence of urine is indicated in the following cases which is not generally recognised. The treatment which Dr. Hicks applied was very successful, and we have no doubt that the record of it will be of great service to practitioners who have patients suffering from this very troublesome condition.

Case 1.—M. A., about 22 years old, had suffered ever since she can remember from nocturnal incontinence of urine, and almost incessant desire to micturate during the day. Had been under a great amount of treatment. She was admitted into Guy's Hospital under one of the surgeons, who examined for stone, but found none. nor any disease of the bladder, but a contracted one. Dr. Hicks offered to take charge of her. He began first by injecting solution of morphia, which lessened the irritability to a great extent, so much so that she was free for two or three nights from her distress. However, no further progress was made, but rather retrocession. Dr. Hicks then ordered the bladder to be distended as much as possible by plain warm water. This was done by his clerk, Dr. Chas. Smith, very carefully, daily. Almost directly she derived benefit, and in the course of a week she was quite well. The treatment was kept up for a week more, and she went out. After three months the nocturnal incontinence returned, and she was readmitted; but the bladder became rather more irritable. Morphia was again used, but not acting so well as before, an injection of nitrate of silver, twenty grains to the ounce of water, was employed. This caused some pain after, but in a week she improved, with occasional trouble at night. She could hold half a pint of urine at a time in the day, but not so much at night. However, by an occasional injection of morphia she gradually regained the power of retention, and went out again free from her complaint. It was curious that for two or three days of the latter part of her treatment she was troubled with complete retention of urine; this, possibly, was of a nervous character.

Dr. Hicks remarked that the constant evacuation of urine permitted by some mothers to their children allowed the bladder to become so constantly empty, that after a time the muscular power of the sphincter was not sufficient to counteract the contractility of the organ. In recent cases, no doubt this could be voluntarily overcome by adults; but in old-standing cases, although we might do much by lessening the sensibility of the bladder, yet we might proceed at once to overcome its resistance by mechanical force, so that further treatment would not be required. This was strongly shown in the following case, which recently was under his care in Guy's Hospital.

Case 2.—The history was precisely similar to that of the last. The bladder was at once injected with water; it shortly held half a pint. The incontinence was rapidly cured; and the patient went out to service.

Both these girls had been unfit for service from their complaint. Dr. Hicks suggested the applicability of this treatment to both sexes, in cases with similar history; at any rate, it would be harmless unless violence were used. He thought it was possible that in some of the cases there were congenitally small bladders, and these possibly might be more difficult to manage.

There is much more difficulty in treating the contracted state of the bladder in chronic cystitis. A great deal can, however, be effected by injections of various kinds, as was shown in the following instance:—

C. C., aged 26, had cystitis after delivery, which caused her great pain, and intense desire to void urine every half hour. Various remedies were tried: styptics and sedatives to the interior of the bladder. Nitrate of silver injection (thirty grains to the ounce) was the most beneficial. The distress it caused was considerable; but she preferred it, as giving most subsequent relief. Morphia solution was always left in afterwards; and also at other times, to lessen the sensitiveness occasionally; mechanical distension was employed, but it was found nearly impossible to inject beyond three ounces at any time. After two months she could retain urine for nearly three hours, when Dr. Hicks thought it might be possible to distend the bladder to a greater extent under chloroform. This was tried; but three ounces was the greatest quantity admitted. There was a good deal of irritation after, and she was not so well as before. After a week she could hold her water only for an hour and a quarter. Afterwards she improved, and could manage to retain urine for an hour and a half, when she left the hospital.

Whether the resistance of the bladder was simply from the thickened walls, or from this and inflammatory adhesions also, did not appear clear in the case. The resistance was very firm. She had, however, gained something altogether by the treatment; but not so much as she would have done had no attempt been made to distend the bladder.—*Lancet, July* 4, 1868, *p.* 7.

108.—NÆVI IN CHILDREN TREATED BY ACTUAL CAUTERY.

Mr. T. Holmes has recently had two cases illustrating the advantage of this mode of operation. The cautery employed was that known as Wordsworth's, which consists of a steel needle springing from a bulb; the latter being brought to a white heat in a blow-pipe flame, it keeps the needle heated for a considerable time. The cutaneous part had been previously treated by nitric acid, and the subcutaneous had been partly removed by the ligature. The cautery was, therefore, employed to destroy a few remaining portions of the nævus tissue. The nævus was pierced in ten or twelve places, the needle remaining hot the while. The result was most satisfactory; there was no irritation nor suppuration.—*Practitioner, Sept.* 1868, *p.* 183.

ADDENDA.

109.—ON THE USE OF CROTON OIL AS A COUNTER-IRRITANT IN HEAD AFFECTIONS.

By Dr. Robert S. Turner, M.A.

[Dr. Turner, whilst resident medicsl officer at the Sick Children's Hospital at Edinburgh, had opportunities of observing an unusually large number of cases of tubercular meningitis.]

Case 1.—Elizabeth Wilson, aged six years, was admitted into the Children's Hospital on the 21st of August, 1867. She was in hospital about five weeks before, suffering from measles, and although convalescent when dismissed had never regained her usual strength. About ten days before readmission, her mother said she had had a fit and afterwards attacks of "the nerves." She had complained for some time of pain in the head and bowels. The bowels were confined. Several children of the same family had died of phthisis in the hospital.

On admission the child was dull and sleepy, kept constantly grinding her teeth, and frequently started in her sleep. The pulse was slow and irregular. From the history and symptoms, the case was readily diagnosed as one of tubercular meningitis. The bowels were moved by an enema, and the stool was carefully examined for worms, but none were found; the hair was cut short, and cold applied to the head; she was ordered also to have two grains of iodide of potassium thrice a day. The symptoms increased in severity, and, three days after admission, she had a convulsion and became comatose, with stertorous breathing and strabismus. Dr. Weir, the physician on duty at the time (to whom I am indebted for liberty to report this and the two following cases), now ordered the head to be shaved and croton oil (one part of croton to three of olive oil) to be rubbed into the scalp. As soon as the croton eruption appeared the coma gradually passed off, and the child began to regain consciousness. She rapidly improved, and about a fortnight after admission was able to get up and run about. On the 15th of September, however, she was suddenly seized with a violent convulsion, and the head symptoms returned. Next day she had another severe convulsion, and died. A post-mortem examination was not allowed.

Case 2.—Helen Allen, aged five years, was admitted 21st August, 1867. Patient had been complaining of dizziness and headache, and had been losing flesh and appetite for about a month before admission. A sister died of tubercular meningitis in the hospital about a year before.

On admission her symptoms were much the same as those of Elizabeth Wilson, just described, and, in addition, she had vomiting and great intolerance of light. There were no worms in the motions, which were at first confined but afterwards loose. She was ordered cold to the head, and iodide of potassium. The symptoms increased, but not so rapidly as in the preceding case. About a week after admission she was decidedly worse. She lay on her back with her eyes turned up, and could not be roused without great difficulty. Her head having been shaved, the croton liniment was now applied, but, before the eruption had time to come out, her breathing had become stertorous, she had slight convulsions, and her urine and fæces were passed unconsciously. As soon as the eruption appeared, however, the symptoms began to abate, and in a few days they had altogether passed off. In addition to the iodide of potassium she was ordered cod-liver oil. For about three weeks she continued well, but as the irritation of the eruption was passing off, she began to complain of headache and giddiness. The liniment was again applied, with the effect of relieving the symptoms, and the eruption was kept up for some weeks, during which time the patient appeared perfectly well. By the middle of October the irritation was again allowed to subside, and although the patient complained of a little headache, the croton oil was not applied till the 20th October. On that day she fell down in a fit, and her head was severely cut by coming in contact with the corner of a stool. Before the eruption appeared she had another less severe convulsion, but on its coming out fully she again got better, and continued so till she was dismissed on the 26th of November.

Case 3.—Andrew Armstrong, aged two years and nine months, admitted 2nd September, 1867. The history was the usual one of tubercular meningitis—irritability, loss of flesh, starting, and grinding the teeth during sleep.

On admission he was in a semi-comatose state, and the pulse and respiration were irregular. His head was at once shaved, and the croton liniment rubbed into the scalp, and he was ordered two grains of iodide of potassium thrice a day. Next day the coma had become deeper, and squinting had come on; so ill was he, in fact, that it was considered hopeless to apply the croton oil again with the view of hastening eruption. On the following day, however, the eruption began to appear, and, as in the other cases, the patient was well in a few days. The irritation was kept up for some time by a weaker liniment. He recovered without a bad symptom, and was dismissed on the 5th of October quite well.

Case 4, was that of a child about three years old, whom I saw in the out-door department of the hospital. I have no notes of the case, and therefore I am not able to detail the symptoms; but they were of such a nature that, taking the history also into account, Dr. Caton, then assistant to the extra physicians, and myself had no hesitation in ascribing them to tubercular meningitis. Directions were given to have the head shaved, and a croton-oil liniment rubbed into the scalp, and iodide of potassium was ordered internally. The child soon got so much better that attendance at the hospital was stopped, and he continued well till the eruption on the head disappeared. About a fortnight after his last visit to the hospital he became much worse, and his mother wrote requesting that he might be attended at his own home. By some accident the letter was not delivered till three days after, and, when I got to the house where he lived, I found another medical man in attendance, who said he was treating the child for acute hydrocephalus.

Case 5 was seen more recently, and is at present in the Infirmary under the care of Dr. Grainger Stewart, who has kindly allowed me to refer to it.

William Macintosh, aged 36, an engraver, was admitted into Ward 6, 22nd January, 1868. Two years before admission, he sustained an injury of the head by falling down stairs, from the effects of which he was laid up for some days. Afterwards, although able to work, he occasionally had fits of headache, with shivering and loss of appetite. In the end of August last he was exposed to cold and wet, and for about six weeks after had severe headache, with occasional loss of consciousness and convulsions, which occurred two or three times a day, and lasted for about five minutes each time. By the end of November he had got better, but on the 24th of December he had a violent convulsion, and from that time became gradually worse.

On admission he was in a dull, drowsy condition, and could be roused only when spoken to sharply and loudly. When answering questions, he spoke very slowly and indistinctly. He complained of pain in the head. The pulse was slow and irregular. The bowels not having been moved for some days, he was ordered a large dose of castor oil. Next day he was much in the same state, or rather worse. The castor oil had not acted, and an enema was ordered. The head was shaved, and croton oil rubbed into the scalp. On the 25th he was much worse, the urine and fæces being passed in bed. The eruption had not appeared on the scalp, and the liniment was again rubbed in. By the evening of the 26th the pulse had become quick, and the breathing stertorous, and he was to all appearance moribund. The scalp, however, was becoming inflamed. Next morning, while his friends were watching to see him die, he suddenly looked up and told them to take away the "dead-screen," which had been placed round his bed. By visit-hour he had got much better, being able to answer when spoken to, and from that time he rapidly recovered. Since then he has had occasional attacks of headache and giddiness, accompanied with indistinctness of speech, but these have always been relieved by the croton eruption.

In all these cases there was undoubtedly some serious affection of the brain or its membranes, and in all of them the disappearance of most grave symptoms occurred simultaneously with the appearance of the croton eruption; not only so, but as the eruption began to fade, the symptoms returned, presenting the "waxing and waning" phenomena of logicians. The relation between the two was so marked that I cannot believe it was other than that of cause and effect. The disappearance of the symptoms cannot be accounted for by supposing it due to the iodide of potassium alone, for this drug has often been used in the same circumstances without effect; and in the last case it was not given till the patient had been roused from coma, and was beginning to get better. I do not deny that it may have had some influence in the ultimate recovery of the patients; but had they not been roused, and the inflammation within the cranium subdued, as I believe it was by the croton eruption, the action of the iodine would not have been established before the death of the patients. As far as I could observe, there was no other circumstauce which in any way influenced the course of the cases.

On looking into the literature of this subject, I find that croton oil has been used before in the same way, and with equally good effect. Dr. Watson, of Southampton, in the British Medical Journal, for 1859, records a case where acute hydrocephalus occurred after the suppression of an eruption on the scalp, which he treated by this means, and which ultimately recovered. In the New Sydenham Society's Year-Book, for 1859, reference is made also to a paper on Tubercular Meningitis, by a Swedish physician, Dr. Bang, in which he recommends counter-irritation by croton oil or tartar emetic, having seen, he says, good results from both.—*Edinburgh Medical Journal, Nov.* 1868, *p.* 434.

110.—THE SPINAL ICE-BAG IN THE TREATMENT OF DELIRIUM TREMENS.

By EDWARD HAMILTON, Esq., one of the Surgeons to Steevens's Hospital, Dublin.

[The treatment by the spinal ice-bag was adopted in consequence of a communication made to the Surgical Society of Ireland by Dr. D. B. Hewitt. Mr. Hamilton says :]

I was called to see Mr. T. S., the proprietor of a tavern in the suburbs, and found him with all the symptoms of *delirium e potu* well pronounced; he was in a state of great excitement and could with difficulty be controlled; pulse 120, weak; hands tremulous; face pale; tongue large, soft, and creamy. He laboured under the hallucination that his wife's coffin was always beside him, and that he was himself dead and should be placed in it. In addition to this state of the nervous system, he suffered from very considerable derangement of the digestive organs, his eyes were icteric, he had vomiting and hiccup, with much tenderness over the right hypochondrium. He had been for some time an habitual tippler, but on the death of his wife, some short time previously, he took to drink continuously. Has had a slight attack before the present. He has had no sleep for the last three nights. A blister was applied to the epigastric region. He was ordered to take a draught every third hour, containing twenty drops of tincture of cannabis indica, two drops of dilute hydrocyanic acid in camphor water; by this treatment the vomiting was relieved, but the patient had no sleep; in the evening he was ordered two grains of watery extract of opium in a tumbler of brandy punch, to be repeated in six hours if sleep was not procured. The following morning I found him still labouring under great excitement, having had no sleep. The skin was clammy and bedewed with cold perspiration, the pupils were contracted, pulse 120, weak; it was evident that in his present condition narcotic treatment could not be further pushed with any degree of safety, and yet the exhaustion from want of sleep was sure to be fatal. Accordingly I procured one of Dr. Chapman's ice-bags, and, having filled it, applied it to the back from the occipital bone to the lumbar regions, having passed the elastic band round the forehead and secured the lower end with a bandage round the waist, giving directions that it should be renewed when the ice had melted. He was placed in bed, the room darkened, and strict quietness enjoined. In the morning, after the ice was applied, he became quieter and more manageable, being, as his attendant expressed it, "cooled down;" at the same time the temperature of the surface was sensibly raised. In a quarter of an hour after the second charge of ice was applied he fell into a deep sleep, which lasted for eight hours. On waking he expressed a wish for food; he had a broiled chop and some bread, and on my evening visit I found him again sleeping naturally. Abstemiousness quickly restored his digestive organs and brought him to his ordinary health.

I was requested by Mr W., residing some distance from town, to see his head gardener, who was labouring under an attack of delirium tremens. I found him walking round his room in wild delirium; his brother who was in attendance on him, found the greatest difficulty in restraining him, as he made violent efforts to escape from the room. I had seen him in two similar attacks, but in neither was the excitement so great as on the present occasion. The plan of treatment which was adopted in his previous illness was resorted to: he was given a dose of castor oil and turpentine, and at night, three grains of watery extract of opium in a glass of punch; on this occasion it was not so successful. I was sent for to see him again the next day, as he had had no sleep in the night, nor for the three nights previously, and was stated to be much worse, the opiate had rested on his stomach; but I found him still violent, pulse 100, skin clammy, pupils contracted; his bowels had been well cleared out. I resolved to try the ice to the spine, but not having the india-rubber bag with me, although ice was easily procurable, I obtained the trachea of a cow from a butcher in the adjoining village, and it answered the purpose admirably—the ends were plugged with cork and lapped over with twine. It was applied to the nape of the neck and down the back. After the third application he fell into a sound sleep, which lasted for six hours, and was followed by complete recovery in a few days.

J. H., proprietor of a public-house in Dublin, usually of moderate habits, became much depressed at the death of his brother, to whom he was greatly attached, and took to drink. He was a man of weak constitution and delicate, although not subject to any special ailment. I found him suffering under great depression; pulse 60, skin cool and moist, tongue peculiarly furred in patches, stomach instable. No sleep for the last two nights. He was rational, except at intervals, but was not violent. He was ordered tincture of cannabis indica, chloric ether, and camphor water, every third hour, and at night to take one grain of watery extract of opium every third hour; to have four ounces of wine and strong beef-tea. I saw him the following morning, he was more excited, pulling the bed-clothes, and very restless. He did not sleep, although three of the pills were given to him; his pulse was 80; he complained of headache and great thirst. He was allowed ice in his mouth. The ice-bag was applied to the spine, as in the case above. In half-an-hour after the first application he slept soundly for several hours, and in the course of the night, his friends, finding that he was not inclined to sleep, and having witnessed its good effects, of their own accord, applied the ice with the best possible result, as he slept the entire night and was convalescent on the following day.—*Medical Press and Circular*, *Sept.* 30, 1868, *p.* 291.

111.—CARBOLIC ACID IN CUTANEOUS DISEASE.

By Dr. F. P. Mann, Brooklyn, N.Y.

[The use of carbolic acid is of course likely to be especially useful in those forms of skin disease depending upon, or accompanied by, the development of any of the forms of fungi.]

Case 1.—*Chronic Eczema.*—The patient, a child six months old, nursed by its mother, a young and apparently healthy woman. Eruption first appeared upon the scalp, when the infant was two and a half months old. The nurse applied olive oil, cleansing the head daily with Castile soap and tepid water; the eruptions, however, progressed rapidly, and when I first saw the child, namely, three and a half months from the time the disease commenced, not only the head but the entire trunk and extremities presented a most pitiable appearance. The thin, soft incrustations, more broad than prominent, of eczema impetiginodes, occupied the head, back, chest, and limbs, while here and there a fresh group of vesicles of eczema simplex pointed out most pathognomically, the true nature of the eruption. The evacuations were variable, sometimes of natural colour, at others persistently green, and always very acid, as shown by litmus; on examination by microscope, they were found to contain milk corpuscles in abundance, mixed with casein, that separated by the lactic acid of the stomach, had passed into the duodenum undigested, and mingling with the bile, had drifted through the intestinal canal. The urine was examined chemically, and by microscope; it was highly acid, depositing urates freely; a few drops evaporated on a glass slide gave glomeruli and isolated crystals of uric acid. The serous exudation beneath the incrustations was also highly acid. The milk from the mother of the child was also carefully examined; it contained an abnormal quantity of lactic acid, though the corpuscles did not coalesce, it gave an acid reaction to neutral litmus. Under the influence of thoroughly alkaline treatment, namely, baths with bicarb. soda, and bicarb. potass. internally, three times per day, in quantities sufficient to completely neutralize the acid reactions of the dejections, urine, and serum from the eruption, (an alkali was also given to the mother,) so rapid was the improvement, that within ten days, the scalp was free from disease, and the irritation of the surface everywhere much abated.

Fresh groups of eczema simplex, however, continued to be reproduced upon both body and limbs. I then determined to try the effects of carbolic acid as a parasiticide, having recently tested its power in the destruction of the penicillium glaucum, and torula cerevisiæ; accordingly, a solution containing half a drachm of carbolic acid in four ounces of water, was applied three times per day, to the eruption. The effect was immediate; the vesicles disappeared promptly, producing a slight exfoliation, and did not return, except a few groups about the neck, which two or three applications of the solution removed.

Case 2.—*Impetigo.*—The patient was a child of ten months old, of strongly strumous diathesis; the psydracious pustules were developed upon the upper lip, and about the mouth, while from the nares issued a sanious and very acrid discharge. The carbolic acid, same strength as before, was used freely upon the eruption, and the nares were also injected with the solution: the effect was quite as marked as in the former case, the postules withered, and soon altogether disappeared, leaving the skin free from irritation.

Case 3.—*Psoriasis inveterata.*—Two years standing; patient a stout girl 15 years of age, body and limbs covered with the eruption. Ordered Donovan's sol. carbolic acid to be applied every morning in proportion of one part of the acid to four of water, body to be sponged with Castile soap and warm water, prior to its application. In three weeks from the date of the first application, not a vestige of the eruption remained. How far the Donovan's solution assisted in producing this rapid convalescence from one of the most obstinate of all cutaneous diseases, I leave others to judge.—*New York Medical Journal, Sept.* 1868, *p.* 515.

112.—THE HYPODERMIC INJECTION OF REMEDIES.

By Dr. Francis E. Anstie, Senior Assistant Physician to Westminster Hospital.

[The subcutaneous mode of administering medicines is still very much unappreciated, not however by those who have given it a fair trial.]

First, as to the question of *danger*, let me say, positively, that there is *absolutely none* if the injector will remember two cautions:—first, that the physical activity of nearly every substance which can be thus used is *three if not four times greater when it is given by the skin than when it is swallowed;* and secondly, that the liquid injected must not be either markedly acid nor makedly alkaline, nor in any way obviously *irritant to tissue.* The only case of serious inconvenience which has occurred among the hundreds of injections I have made was the formation of a small abscess in the cellular tissue of a gentleman in whom I injected *chloroform*, an agent entirely unfit to be used in this way, as I am now aware.

The advantages of the hypodermic over the gastric administration are these :—1. Economy of the drug. 2. Entire abolition of the depressing or irritant effects which are locally produced in the alimentary canal during the *digestion* of various remedies. 3. Far greater *permanence of effect*, in many cases, than can be produced by medicine swallowed. 4. Much greater rapidity of action—a quality which makes injected remedies of priceless value in certain emergencies. One most important conclusion from these facts is this *that anodynes and hypnotics ought never to be administered by the mouth in acute disease attended with anorexia.* The practical importance of this principle is immense. Regular and systematic nutrition is the great necessity and the great difficulty in these diseases, and the avoidance of any treatment tending to interfere with digestion of simple food is a cardinal duty.

I shall first say a few words as to the operation of hypodermic injection, and then say a little about particular drugs.

The three kinds of syringe recommended by the Medico-Chirurgical Society's Committee (namely, Coxeter's, Whicker and Blaise's, and Weiss's) are each of them sufficient and good. The ideal syringe perhaps is a Coxeter, with the addition of a screw-joint by which the barrel can be removed and refilled without withdrawing the canula from the skin. Such an instrument is so cheap as well as handy that the surgeon can afford to have two, in case of breakages : and breakage does not inflict very large expense. A country doctor should never start on his rounds without a syringe and a bottle of morphia solution, such as will be described presently. He should have one or two steel canulas, besides the gold ones ordinarily used ; these are useful to penetrate tough skin, especially skin which has been frozen with ether spray, a necessary preliminary with some sensitive patients.

The best *mode* of making the injection is that described by Mr. Charles Hunter, to whom we owe so much of our knowledge of the subject, viz. to pick up a fold of loose skin and push the canula right through till its point works loosely in the subdermic cellular space ; then inject slowly with two or three pauses of a second or two ; wait one minute, and then withdraw the canula slowly, pressing firmly with the finger on the track and keeping it applied to the puncture for a minute or two. It is a mistake to apply plaster (except in the rare instances where a large quantity of fluid has to be injected), for it leaves an ugly mark on the skin for some days. However, it is not always possible to find a convenient loose fold of skin, and in this case another plan must be adopted. The skin must be strained to one side with the thumb, and the canula run in with a steady pressure; the disadvantage of this procedure is that it is rather more painful, and that we are not sure of getting into the subcutaneous cellular tissue: failing this, it is rather more difficult to get the fluid in; the injection must be more slowly performed, and it may be necessary to apply plaster to prevent its escape.

[In the vast majority of cases it is a matter of indifference as regards the effect on the pain, where we inject, provided we select a favourable place for absorption, and vary the place of injection each time in order to avoid local irritation. When, however, the painful part is a convenient place for injection it is well to perform it locally.]

And now with regard to the drugs that can be used. Those which I have myself employed are opium, morphia,* and codeia, atropine and its sulphate,* veratrine,* caffeine,* camphor,* Indian hemp,* strychnine,* aconitine, as hypnotics or anodynes; quinine* both as anodyne and antiperiodic; podophyllin as a purgative; prussic acid* as a calmative in vomiting; corrosive sublimate* in congenital syphilis; arsenic* and atropine* as anti-spasmodics. Besides this, woorara and nicotine have been successfully used by others for tetanus; conïa for asthma and angina; digitalis for various febrile conditions; tartar emetic as an emetic, &c. Among those which are mentioned as having been employed by myself, all those marked with an asterisk have been found useful; the rest proved either inert or superfluous. As it would be quite impossible here to detail the results of all these experiments, I shall confine my remarks to two drugs which are comparatively well known, and two other drugs which are very little known, but will probably prove most important, as hypodermic medicines. The first two are morphia and atropine, the others strychnine and caffeine.

1. Morphia should be used in the form of acetate, dissolved with a minimum of acetic acid in hot distilled water, five grains to the drachm. As the salt varies in solubility it will often happen that on cooling the solution will solidify: this is not of much consequence, as it can be heated in hot water at the moment of use. Ten grains to the drachm can easily be dissolved by the use of *glycerine:* but in the first place (according to my experience of the doses which are most useful) this is needlessly strong for any but quite exceptional cases; and

secondly, an important question has suggested itself to Dr. Lawson, which I have not yet had time to settle decisively, whether the influence of glycerine does not diminish the physiological activity of morphia salts. I confess that I have grave suspicions on the matter; and meantime the five-grain preparation answers extremely well. One minim of this will represent one-twelfth of a grain, a very useful minimum dose in cases of slight neuralgic pain. Two minims ($\frac{1}{6}$ grain) is the best commencing dose for the relief of severe pain, and as a hypnotic in states of nervous irritability. Three minims (or $\frac{1}{4}$ grain) is an *unsafe dose to commence with:* dangerous and even fatal results have been known to follow its use. It should not be given till smaller doses have been tried. It can rarely be advisable to increase the dose above six minims ($\frac{1}{2}$ grain) except in the case of persons habituated to indulgence in opiates.

The advantages of the hypodermic injection of morphia over its administration by the mouth are immense. The salt, used in this manner, is at least three times as powerful, for every therapeutic purpose, as when swallowed; and, meantime, the majority of the unpleasant symptoms which opiates can produce are entirely absent. The fact seems to be, that in the gastric digestion of morphia much of the salt becomes decomposed, and its specific effect on the blood is lost; but during the digestive process it acts depressingly upon the gastric nerves, and *pro tanto* disorders the functions of the stomach. In acute diseases, and especially in delirium tremens, we ought never to give opiates by the mouth when subcutaneous injection of morphia is possible.

The advantages of morphia hypodermically administered over opiate medication by the stomach are such as would be *à priori* incredible, nor can they as yet be fully explained. In particular, it is impossible to account for the far greater *permanence* of its action in relieving nerve-pain, which is so marked as that its discovery has initiated quite a new era in the treatment of severe neuralgias. Affections of this kind, which under any of the older plans of treatment would at least have been very tedious, are sometimes cured after three or four injections of $\frac{1}{6}$ grain each; and very many yield after a week or ten days of such injections, repeated twice daily. Even the inveterate and incurable "epileptiform" facial tic may be so benefited, that life, from being a horrible and intolerable burden, may become, not cheerful indeed, but comparatively peaceful and calm. Moreover, it is certainly the fact that there is far less tendency with hypodermic than with gastric medication to rapid and large increase of the dose, when morphia is used for a long time together. And the "antiphlogistic" virtues which have been ascribed to opium would certainly, if ever, appear to be verified by the effect of hypodermic injections of morphia in threatening percarditis, pleurisy, &c.

2. Atropine is an extremely valuable hypodermic agent for the relief of local pain and spasm. It should be employed in the form of solution of the sulphate: four minims containing $\frac{1}{60}$ grain; two minims will be the proper commencing dose in adults, unless the pain to be relieved is very severe. It should be cautiously increased to $\frac{1}{60}$ or $\frac{1}{50}$ grain; more can seldom be needed, and very uncomfortable poisonous effects may easily be produced if it be pushed to higher doses. *Apropos* of dosage, it is a positive duty here to notice one of the most astounding blunders ever committed by an eminent teacher—a blunder by no less a man than M. Trousseau—which, if not corrected, might lead to most seriously mischievous, or even fatal, practice. M. Trousseau makes the amazing statement that atropine is less active by the skin than by the stomach, and that as much as $\frac{1}{10}$ *or even* $\frac{1}{5}$ *of a grain may be used without causing inconvenience.* He even proceeds to say that the same rule applies in the case of morphia, which is similarly more active by the stomach than by the skin! This is Homer nodding with a vengeance; and one can only hope that scarcely any one has read that part of M. Trousseau's otherwise excellent paper. Otherwise, the consequences might have been very grave, if we consider that $\frac{1}{4}$ of a grain of morphia has once proved fatal, and many times dangerous, and that the most serious symptoms have been induced by $\frac{1}{60}$ of a grain of atropine. Indeed the slighter symptoms of atropism, which fortunately are of no serious moment (dryness in the throat, vertigo, and diplopia), are occasionally produced by doses three or four times smaller than this. Their appearance is an indubitable sign that it would be unsafe to push the remedy in larger doses.

Atropine is not a direct hypnotic, though it often makes sleep possible by relieving severe pain. It holds to morphia a notable relation in the series of hypodermic remedies for pain.

It is somewhat less frequently tolerated (in doses which are sufficient to relieve pain) than morphia; but it is an interesting and very valuable fact, that persons who are quite unable to bear morphia will often bear atropine, and *vice versâ;* and even in cases when both remedies are tolerated, we sometimes find morphia, and sometimes atropine (the latter most frequently), producing a *permanent* effect. This relation, which I have often noted, has been remarkably illustrated in two cases which have been under my care during the last few days: one was a case of severe neuralgia attending shingles, and the other a case of extreme neuralgic pain from long impacted calculus in the ureter. In both cases morphia failed, and in the latter it always caused most unpleasant toxic symptoms, while atropine produced the most beneficial results in doses of $\frac{1}{60}$ and $\frac{1}{100}$ of a grain, respectively. I have also obtained excellent results with atropine in a case of spasmodic asthma, when opiates could not be tolerated in any shape; and, on the other hand, a case was lately under my care of sciatica in a young lady, where morphia acted beautifully, though atropine could not be borne even in the dose of $\frac{1}{100}$ grain.

A special hypodermic application of atropine which appears to me to promise the most valuable results, is its use in painful iritis, and especially in threatening glaucoma. I firmly believe that in two cases I have succeeded in preventing the latter affection from developing itself; at least the most threatening symptoms were present, and rapidly subsided under the use of one-sixtieth grain injections of atropine.

Finally, I may remark of atropine that it is incomparably the best of all medicinal remedies for every kind of pain in the pelvic viscera. Nothing can approach it in this respect.

3. *Strychnia* has been used by me in quite a different class of cases to that for which only, so far as I know, it has been used by others. I have seen no valid reason for using it in *paralysis*, as many have done. But I have tried and proved it to be a most valuable remedy in certain varieties of neuralgic pain, viz gastralgia, and neuralgia of the heart. The proper form is a solution of sulphate of strychnia, 2 grains to the ounce of distilled water, and the proper commencing dose is two minims ($\frac{1}{120}$ grain). The doses recommended by Eulenburg for paralytic affections are much too large for anodyne purposes, and we risk unpleasant toxic effects if we carry the dose beyond one-sixtieth of a grain. My decided opinion is, at present, that there is no such remedy for gastralgia as strychnia, subcutaneously injected in doses of $\frac{1}{120}$ to one-sixtieth of a grain.

4. The last hypodermic agent I have to refer to is caffeine, which I have employed in two cases of neuralgia and one of insomnia from chronic alcoholism. The dose employed in each case was one grain. In one instance of severe neuralgia of the superficial branches of the circumflex in the shoulder, two successive injections of caffeine (over the biceps) appeared to cut short the malady altogether. In a case of dorso-intercostal neuralgia attending shingles, the patient was injected daily for five or six days, with the effect of notably mitigating the pain on each occasion. And in a woman who had drunk to great excess for years, without ever having distinct delirium tremens, but could not sleep at all, and was a prey to distressing visual hallucinations, a notable improvement was effected by caffeine. She was injected twice a week for three weeks, and on each occasion got great temporary relief, which various other remedies

(quinine, ether, morphia) failed to produce. Unfortunately, she then ceased to attend. I cannot but entertain the hope that caffeine may prove a very valuable remedy, both in neuralgia and in alcoholic insomnia. —*Practitioner, July* 1868, *p.* 32.

113.—ELECTRO-THERAPEUTICS.

[The following article by the Editor of the British Medical Journal gives to some extent an outline serving to indicate the present state of electro-therapeutics.]

Frictional electricity, though formerly much employed in medicine, is now entirely superseded by the use of the Galvanic and Faradic currents. Galvanism, or the galvanic current, is the term applied to that form of electricity which is derived from the contact of two heterogeneous metals immersed in a fluid which exerts a chemical action on one of them. Faradism, or the faradic current, is the term used to designate the electrical currents which are *induced* in a coil of conducting wire when a magnet is brought near to or removed from it, or by the formation and the rupture of a galvanic current passing through another coil near but not in contact with the first.

The galvanic current will continue as long as the chemical action in the battery; hence it is often termed the *continuous* or *constant* current. On the other hand, the faradic current is instantaneous; and, because it is produced by induction, the term "induced current" is used by many authors to designate it. On the whole, it seems advantageous to adopt the two terms galvanism and faradism, as indicating the two kinds of electricity used in medicine; and to speak of the therapeutical employment of the one as galvanisation and that of the other as faradisation.

Many kinds of batteries might be used to generate the galvanic current; but that invented by Daniell is the best, on account of its cleanliness and cheapness. Each cell of the battery contains a plate of copper immersed in a solution of sulphate of copper, kept saturated by a quantity of crystals of the same, and a plate or cylinder of amalgamated zinc immersed in dilute sulphuric acid (one of ordinary sulphuric acid to eight or ten parts of water). The acid is separated from the copper solution by a porous clay cell. When a number of elements are employed, the zinc or negative pole or electrode of one cell is joined to the copper or positive pole or electrode of another cell.

To obtain the inducted or faradic currents, we may use a rotatory magnetic machine, in which coils of wire surrounding cylinders of soft iron are caused to revolve before the ends of a permanent steel magnet. The induced currents obtained from this machine are recommended by Dr. Althaus (Treatise on Medical Electricity, p. 202. London: 1859) for the treatment of some cases of deficient vision and rheumatic callosities. By a number of distinguished electro-therapeuticians, however, this apparatus is not used, because it is apt to get out of order, the currents obtained from it are of very inconstant strength, and the necessary turning of the handle is most wearisome.

The galvano-induction machines in common use are, therefore, to be preferred for producing the faradic currents. They consist of two coils of wire—one, a short coil of thick wire termed the primary coil; the other, a long coil of very thin wire, termed the secondary coil, which generally surrounds the first, but has no connection with it. The wire of the primary coil is connected with a galvanic battery, consisting usually of a Smee's or Daniell's element; and the current which circulates through the primary coil is termed the primary current, while that which is induced by this in the secondary coil is termed the secondary current. The influence of the primary current is much increased by a bundle of soft iron wire inserted within the primary coil; and the strength of the secondary current may be varied by pulling out or pushing in the bundle of soft iron within the coil. The strength of the secondary current may also be graduated with great nicety by varying the distance between the primary and the secondary coils. In Du Bois Reymond's induction machine, this mode is adopted: when a strong current is wanted, the secondary is placed so as to surround the primary coil; while, in order to obtain a weak current, the one coil is pulled away from the other. Du Bois Reymond's machine is the best for physiological purposes; for therapeutical ends, it is also excellent; but it is not sufficiently portable. For portability, Stöhrer's machines are perhaps the best. Everything required is packed in a small box, and, when the machine is put into use, nothing requires to be removed from the box. As the induced current is instantaneous, and only produced on forming or on breaking the primary current, an arrangement, termed a Neef's hammer, is employed to rapidly break and re-form the current in the primary coil. The term "interrupted current" is often used to designate a succession of faradic or inducted currents. This is a most misleading term, which ought to be abandoned, because the galvanic or continuous current may be rapidly interrupted, and in that case the term would as properly apply to the galvanic as to the faradic current.

In the faradic current, the electricity is of high tension, and is a much more powerful irritant than the electricity of low tension, which constitutes the galvanic current. When the thermal and electrolytic effects of electricity are wanted, *e.g.*, to heat a wire with which to remove a tumour, or to coagulate the blood inside an aneurism, the galvanic current is employed, because in it the electricity is great in quantity and low in tension.—*British Medical Journal, July* 11, 1868, *p.* 31.

114.—ARSENIC AS AN ANTIDOTE TO THE POISON OF SERPENTS.

In the second volume of the Medico-Chirurgical Transactions Mr. Ireland gives the result of a treatment put in practice by himself at St. Lucia, in the West Indies, in the treatment of persons bitten by a venomous serpent, the coluber carinatus of Linnæus. The bite of this creature was usually fatal in from six to twelve hours. His plan was to administer two drachms of liquor arsenicalis, equal to one grain of arsenic acid, with ten minims of laudanum, and an ounce and a half of peppermint water, in combination with half an ounce of lime-juice every half-hour for three or four hours; at the same time ordering a cathartic clyster every hour; and, after paring the edges of the wound, fomenting it, and then applying a liniment, consisting of spirits of turpentine, liquor ammoniæ, and olive-oil. In three or four hours purging was established and the arsenic was stopped. Mr. Ireland treated four cases in St. Lucia, and one in Martinique, with the utmost success, and without a bad symptom. In one of the cases vomiting was induced, but the clyster was continued until purging was established, and then the vomiting ceased, and twenty minims of laudanum were exhibited, with fifteen of sulphuric æther and an ounce and a half of peppermint water. In the latter case, also, there was some irritability of the bladder and loss of power in passing urine. M. Chevalier, in his comments on this treatment, remarks that it does not "appear at all unreasonable that, where such sudden and extreme debility is produced as takes place from the bites of serpents, a much larger dose of a powerful remedy might be taken with impunity than could be borne in any ordinary state of the human frame." And he adds that he was led to recommend a trial of arsenic to Mr. Ireland, from the facts recorded in Dr. Russell's "History of Indian Serpents," on the authority of Messrs. Duffin and Ramsay, who state that the Tanjore pill is administered with considerable success in India after the bites of venomous serpents, the formula of the Tanjore pill being as follows, namely: arsenic, roots of vellinavi, roots of neri visham, kernels of nervalam, pepper, quicksilver, of each an equal quantity; the quicksilver is rubbed with the juice of the wild cotton until the globules are invisible; the arsenic is levigated, and the materials are beaten up together with the juice of the wild cotton to a proper consistence, and divided into six-grain pills, each pill containing one grain of arsenic. In two out of three of Dr. Russell's successful cases the Tanjore pill produced vomiting, in one purging also, and in one the operation was gentle by stool and perspiration only.—*Journal of Cutaneous Medicine, July* 1868, *p.* 223.

115.—NITROUS OXIDE AS AN ANÆSTHETIC.

By W. A. N. Cattlin, Esq., Brighton.

Repeated experiments upon the lower animals have strengthened my conviction that nitrous oxide is not so dangerous an agent as many have supposed it to be. Even with our present limited knowledge of its action, it will be found to possess some advantages over other anæsthetics for short surgical operations, and I shall be surprised if it does not ultimately prove less dangerous to life and health than chloroform, although I do not expect it will supersede chloroform or other anæsthetics for very protracted operations. I have seen it administered twice and thrice to the same patient, during very painful cases of tooth extraction, with the best possible effect.

Nitrous oxide (as your readers are aware) may be solidified. It has lately been exhibited by Dr. Evans, of Paris, in the liquid form in a bottle composed of aluminium bronze, but the intense degree of cold which is created when this fluid passes from the denser into the rarer state, coupled with other chemical disadvantages, leads me to think the gaseous form will always be most convenient for anæsthetic purposes.

Pure nitrous oxide may now be obtained (of Mr. Barth, 26, Duke-street, Bloomsbury-square) in small wrought-iron bottles containing fifteen gallons of compressed gas, which can be drawn off in any quantity for immediate use; therefore, the advantages of supply and portability have already been gained. It may easily be administered from an india-rubber bag with an elastic tube, which can be attached to the ordinary mouthpiece connected with the late Dr. Snow's chloroform-inhaler, or, what is better, through the very delicate bivalved mouthpiece invented and now used by Mr. Clover. For Hospital and Dispensary practice Mr. Alfred Coleman has invented a very ingenious instrument by which nitrous oxide may be deprived of carbonic acid when the same gas is inhaled by many patients. Thus far nitrous oxide has a fair start in the race which various anæsthetic agents are running, and it remains to be seen whether the researches which a committee of the Odontological Society are making to ascertain its properties will confirm or contradict the reports of individuals.

If this anæsthetic comes into general use (and I think it will be most valuable to dentists), it will probably be administered to patients in every imaginable condition. Latterly I have been endeavouring to ascertain the effect of nitrous oxide manufactured by persons unskilled in chemical science, and with this view I directed my female servant and gardener each to make some of the gas, while my son and myself also prepared some. Every sample was made from nitrate of ammonia, obtained from Messrs. Bell and Co., of Oxford-street, and in each case the gas was passed through solutions of protosulphate of iron and caustic potash. To test the action of the different samples, a glass jar capable of holding about four gallons of water was filled with nitrous oxide which had been made by my servant—it had been in a cylinder gasometer eight days, and in india-rubber bags one day. A guinea-pig was made to float under the jar upon a large bung which had been fitted to the size of the jar. It was very gradually affected, and fell down at the end of three minutes; at the expiration of five minutes it was removed, apparently dead and incapable of feeling. It recovered very slowly, and breathed with great difficulty for half an hour. A rabbit was then placed under the same jar, filled with fresh gas, which had only just been made under my own superintendence. It was more slowly influenced than the guinea-pig, fell down on the cork in five minutes, and was removed at the end of seven minutes. It recovered more slowly, but in the same manner as the guinea-pig had done. A fresh guinea-pig was now placed in some gas which had been made twenty-four hours before by my son. The animal was immediately affected, fell down in half a minute, rallied a little, then became insensible, and was removed from the jar at the end of five minutes. It recovered sensibility at the end of eight minutes, but breathed heavily for about half an hour. Some more of the same sample of gas was added, and a little air passed into the jar, when a rabbit was placed under it. The rabbit at once began to breathe with difficulty, fell in one minute, was removed in five minutes, and made the same kind of recovery as the former one. For the next experiment the jar was nearly filled with two samples of the gas, and some air passed in, when a strong cat was put under it. The cat gradually became stupefied, fell down at the end of three minutes, and was removed at the expiration of five minutes. In about five minutes afterwards it staggered into the house, ran into the cellar, and soon recovered.

A fresh rabbit was introduced into the same jar containing only atmospheric air. At the expiration of half an hour it seemed almost as lively as ever, and, our patience being exhausted, the animal was released. It will be seen by reference to my former experiments (Medical Times and Gazette, June 6) that various kinds of animals were affected more rapidly and recovered quickly when nitrous oxide obtained from Messrs. Bell and Co., of Oxford-street, was administered with inhalers made upon Snow's principle. I have merely detailed the facts as they occurred, and leave your readers to form their own conclusions.—*Medical Times and Gazette, July* 18, 1868, *p.* 78.

116.—BROMIDE AND BIBROMIDE OF MERCURY AS THERAPEUTIC AGENTS.

By Dr. Protheroe Smith, Physician to the Hospital for Women.

[Bromide and bibromide of mercury are precisely the analogues of calomel and corrosive sublimate in chemical composition. Therapeutically, however, it is impossible from the knowledge of the effects of one body to premise the action of its analogue. As, however, the relative amount of bromine to mercury in bromide of mercury is greater than that of chlorine to mercury in calomel, we may suppose that the aid of the former salt will play a more important part in its therapeutic effects than that of the latter in its similar action.]

Having been in the habit of prescribing the bromides of mercury during the past five years, and being impressed with their value as therapeutical agents, I wish concisely to point out their general effects, in the hope of enlisting others in this investigation; so that, by long and continued observation, we may together accumulate such knowledge of their powers as may enable us more accurately to judge of their merits, as compared with those of the chlorides.

I have found, with the protobromide or subbromide, that a less dose than of calomel is required; that it acts more agreeably and effectually, both as a cholagogue and purgative, without the depressing results so often observed to follow the exhibition of calomel. It seems to be useful in promoting the absorption of hypertrophied glandular and other morbid tissue with less constitutional disturbance than the chlorides. I have administered it, with apparent great relief, in cases of biliary congestion of the liver, in chronic hepatitis with enlargement, and in those skin-diseases which yield best to the influence of mercury. I might quote some interesting cases of large anomalous tumours of the abdomen sensibly diminishing, and in two instances wholly disappearing, under the use of these remedies—viz., the protobromide of mercury in half-grain doses, and the perbromide in the form of an ointment of four grains to the ounce of cold cream; also of uterine tumefactions and morbid deposits around the cervix uteri and in the connective tissue of the pelvis, treated with pessaries of the perbromide, as well as the ointment externally. I could cite other instances of acute and chronic inflammatory disease in which the bromides have been apparently of great use; but my observations have been as yet so limited, and the difficulties of making perfectly correct observations on the action of a new remedy are so great, that I think it best to forego such means of proving its value till a mass of evidence can be adduced which may better test the accuracy of my conclusions.—*British Medical Journal, Oct.* 17, 1868, *p.* 422.

117.—PHOSPHORIC ACID IN THE TREATMENT OF DIABETES.

By Dr. J. G. Thornley, Newry, Ireland.

[The patient was a man twenty years of age, and his symptoms were those of a bad case of diabetes. He had been under treatment with bitter tonics, the use of bran bread and claret wine, but the improvement was trifling.]

I commenced treatment by giving grs. v. of pulv. Doveri three times a-day; a full dose (grs. 2½) of opium every second or third night; 25 drops of dilute phosphoric acid in a glass of water thrice daily after meals, and 30 drops of tinct. ferri perchlorid. twice daily before meals. Jalap, podophyllin, scammony, and castor-oil, were each in turn administered as purgatives. Warm clothing, and entire abstinence from alcoholic liquids were enjoined. Weak beef-tea and mutton-broth were recommended as drink. Under this treatment the improvement became very marked: the urine became less in quantity and of lower specific gravity, so that he was obliged to rise only once during the night to pass water. The weakness became less, and thirst became considerably abated, but the appetite was not changed, it was still excessive, and craving. He became tired of taking medicine, and also of the monotonous diet, which consisted mainly of beef, bran bread, and mutton-broth; he also gave up taking the Dover's powder and tinct. ferri perchlorid., trusting alone to the dilute phosphoric acid, which was now increased to 30, and ultimately to 35, drops for a dose, which latter had still the effect of keeping down the thirst.

As the appetite was still excessive creosote was tried in various combinations, but owing to its nauseous flavour the patient was unable to persevere in its use; it had therefore to be discontinued. Sulphate of zinc, tannic, and hydrocyanic acids were tried, but they proved valueless. Cod-liver oil was used for a considerable time, and it seemed to do good; it certainly improved the appearance of the patient. Alcoholic drinks of all kinds, even the claret wine, induced a state of feverishness, and invariably increased the thirst; they were therefore strictly forbidden. The patient himself has the greatest confidence in the dilute phosphoric acid, and continues to take it to the neglect of every other remedy. It has so much improved him, that he now only drinks four pints during the day, and is seldom disturbed during the night, either by having to rise to drink or pass water. The appetite is somewhat, but not materially lessened; the skin is almost natural, and the bowels tolerably regular; the urine is greatly lessened in quantity, and of specific gravity 1039, ranging occasionally to 1042, and the strength strikingly improved. He has been able to follow his employment during the past six months, and is much more cheerful than formerly.

Now, I do not mean to say that phosphoric acid will cure cases of diabetes, but I believe that it is the principal, if not the only agent by which the thirst in diabetes can be materially lessened. I have observed its beneficial effects in two other cases, and I quite concur with the late Dr. Prout, who, I believe, was the first to introduce it to the notice of the profession, that it is of the utmost use in this inveterate disease. As to creosote, I cannot speak definitely, as owing to its disagreeable taste the patient was unable to continue its use sufficiently long. Tincture of perchloride of iron, Dover's powder, and opium, are valuable medicines in this disease, but any one of them used separately will not produce the same beneficial or striking effects of the phosphoric acid. As for tannic acid, sulphate of zinc, and hydrocyanic acid, I have never been able to discover their beneficial effects; but, on the contrary, I think the two former are productive of mischief by increasing the constipation. As for cod-liver oil I would recommend that it should get a fair trial in every case. Perseverance and self-control must be inculcated on every patient, without which success in treatment can never be attained.—*Medical Press and Circular*, *May* 20, 1868, *p.* 450.

118.—ANIMAL VACCINATION.

By Dr. William H. Stone, Port of Spain.

On my arrival, a few months back, in the island of Trinidad, West Indies, I found that amongst other functions with which I was temporarily invested were those of Vaccinator-General. The system of vaccination did not appear to be in a satisfactory condition; besides a considerable prejudice existing against its performance amongst the lower classes, the vaccine virus in use seemed feeble, uncertain in action, and liable to deteriorate rapidly.

It had been customary to keep up the standard of vaccine virus by frequent importations from England; but in my last communication with the National Vaccine Establishment I intimated a hope that I might find a local source of supply. This I have since been able to do successfully by the vaccination of cows in the Government pastures. Up to the present time the effect has been most decided; whereas the matter formerly in use produced small, scanty, and late pustules, I am now obtaining them large, abundant, and well-matured on the eighth day. The number of failures formerly bore a large ratio to the successes; but I have now vaccinated 112 cases in succession with two failures, one of which succeeded on revaccination.

The prejudice noticed above has, moreover, been materially diminished by this plan. It takes its origin in the widely spread fear of leprosy. This disorder, or rather, as I regard it, these two, if not three, distinct disorders, are unfortunately common here, and Creole minds are only slowly taking in the modern evidence of their non-contagious nature. If any contagion whatever exists, it must be admitted that inoculation would be very likely to develope it; and I have myself so far felt the reason of the objection that I have exhibited much more strictness in choosing cases from which to vaccinate than would be necessary elsewhere. But with matter direct from the cow there need be no fear whatever, as I am unaware of any disease kindred to leprosy having been observed in that animal.

The *modus operandi* was simple in the extreme. After isolating a fine young cow, I made several superficial incisions, or rather scratches, on the soft skin between the udder and the teat, choosing a part free from hairs, and unaffected by the slight cracks which appear to attack this locality. Into these incisions I blew the contents of two or three capillary tubes recently filled from a successful vaccination, using purposely a larger quantity than would be required for the human subject. I performed two such inoculations, one on each side of the udder. The cow was then turned loose with the herd, which is of a mixed breed, between the Brahmin and European cattle.

On the sixth day the cow was again caught, and on examination, there was evident promise of success in the hardening and redness surrounding the punctures for about two inches. But no pustule was formed until the eighth day, when I removed the lymph in capillary tubes. It would, I believe, have been more abundant on the following day, as the pustules, about the size of a fourpenny-piece, of a brilliant nacreous white, with depressed centre, were still in the act of filling; but I preferred a smaller quantity of pure matter to the probability of a larger and less active yield. The cow evidently suffered from some local annoyance—was constantly licking the pustule, and showed decided signs of kicking when the matter was removed ; otherwise she was and has continued healthy.

With the lymph thus obtained I proceeded to vaccinate the finest Portuguese and other white children I could lay hands on. The result, as above stated, was to be noticed immediately. Vaccinations performed with this lymph on the eighth day presented singularly large full vesicles, often the size of a threepenny-piece, occasionally in other spots than in those of the puncture—for instance on the shoulder in one case, and on the face in another. The surrounding areola and constitutional disturbance were proportionally marked, but all the children did exceedingly well.

The lymph from these first vaccinations I distributed, as my duty is, to the various local vaccinators over the island. I understand that they have found the results equally satisfactory; very few demands were made for second supplies; and Dr. Kirkman Finlay, the resident surgeon to the San Fernando Hospital, one of the oldest and most scientific practitioners in the island, writes to me as follows :—"The results have been most satisfactory, without a single failure. Several cases presented in both arms a triple row of numerous pustules. This has never occurred to me before in vaccinating from imported lymph, and shows the great advantage derived from the practice you have introduced of procuring lymph in this colony."

The supply thus secured has been so abundant that, after satisfying the twenty-four district vaccinators, I have been able to spare a quantity for presentation to the Governor of Martinique, and am in course of forwarding other specimens to the Venezuelan Government.

As this topic has recently been mooted in the columns of the Lancet, the above may be worthy the attention of the profession. Besides its immediate practical bearing, the experiment shows the possibility of reinfecting the cow from human vaccine lymph, and *vice versâ;* and it goes far to establish the identity of symptoms and course in the disorder thus produced under very different climatic conditions from those which prevail in England.—*Lancet, May* 30, 1868, *p.* 684.

119.—A CASE OF SYPHILITIC ULCERATION OF THE THROAT TREATED WITH SULPHUROUS ACID.

By Dr. H. S. Purdon, Physician to the Belfast Dispensary for Diseases of the Skin, &c.

We are indebted to Dr. Dewar, of Kircaldy, and Mr. Pairman, of Biggar, for bringing more prominently under the notice of the profession the various uses of sulphurous acid as a therapeutic agent; and several cases have been recorded in the medical journals in which this remedy has effected speedy cures. The following case, I think, testifies to its value.

Mr. Robert W., aged 30 years, consulted me on August 17th, 1867, for a hard chancre of a few days' duration, situated at the corona glandis, which I touched with strong nitric acid, and prescribed "blackwash" as a local application, with the green iodide of mercury internally. Under this treatment, he was apparently cured, and I lost sight of him till the following November. I may mention, he told me that about four years previously he contracted a chancre, and which was quickly followed by a bubo. The medical man he then consulted prescribed "Plummer's pill," and which occasioned profuse salivation. I again saw him in November, and found that he was labouring under a syphilitic affection of the throat, both tonsils and part of the pharynx being covered with an ash-coloured slough; he experienced great difficulty in swallowing, appetite bad, passed sleepless nights, and was extremely anxious about his present state of health; no cutaneous eruption visible. For upwards of eight weeks various remedies were tried, viz., iodide of potassium, in ten grain doses three times a day, the bichloride and biniodide of mercury, gargles of chlorate of potass and alum, and solution of the nitrate of silver, twenty grains to the ounce, with opium at night to procure sleep. This treatment only checked the spread of the disease, which remained in *statu quo* till the middle of January, when I happened to see recorded in the Lancet, for October, 1867, a case in which a patient of the London Hospital was treated for syphilitic ulceration of the throat by the application of sulphurous acid spray. I thought Mr. W.'s case likely to benefit by the same treatment, and commenced using the spray to the affected part three times daily on January 25th inst. At first I applied it for a short time only, but, finding that it gave no pain, the end of the instrument was brought nearly in contact with the part affected, and the application of the spray continued for several minutes each time. On Saturday, February 15th, the throat was perfectly well, and there has not been any return of the disease since.

I have at the present time under treatment a gentleman suffering from a syphilitic affection of the tongue, in which I am applying the sulphurous acid spray with the best results.—*British Medical Journal, May* 9, 1868, *p.* 447.

120.—ON THE THERAPEUTICAL ACTION OF DIGITALIS.

By Dr. Edward Mackey, Joint Professor of Materia Medica in Queen's College, Birmingham.

[The great question of the day in therapeutics, is undoubtedly the action of digitalis on the heart. The author's experience of the remedy is the same as that of most recent writers on the subject, viz., that it has the power of strengthening and making regular a feebly acting heart. In support of this he offers the following clinical experience.]

Case 1.—(Dr. Handfield Jones, Medical Times and Gazette, December, 1862.) Male aged 65. He was anasarcous; dyspnœa was so great, that he could not lie down; the heart-sounds were weak, the impulse diffused, the area of dulness increased; no evident murmur; no arcus senilis; no albumen in urine. On February 22nd he began to take ten minims of tincture of digitalis with ten minims of tincture of sesquichloride of iron and chloric ether. On February 25th he was reported better; no panting; pulse and heart's action stronger and firmer No doubt the rest in hospital helped to this improvement; but on April 2nd he had relapsed since the digitalis had been omitted for ten days and cinchona substituted; whereas "on the 6th of April he was improved again, digitalis having been resumed in about five drachm doses of infusion." The drug was given then, "when the heart's action was certainly failing, with the effect of strengthening that action."

In the same paper Dr. Jones reports a case of "dilatation and enfeeblement of heart: no better case could be imagined to test the influence of digitalis, and the result was unequivocal. Instead of causing any further depression of the enfeebled organ, it decidedly increased its tone and power, and that more than any other remedy given."

Case 2.—(Dr. Stirling, Medical Times and Gazette, March, 1864.) Mrs. F., aged 69, for six years had had occasional attacks of dyspnœa, with irregular heart's action. In March, 1862, a severe attack came on suddenly. Soon afterwards there set in congestion of the lungs, cough with hæmoptysis, œdema and ascites; the pulse at the wrist was almost imperceptible, and the action of the heart tumultuous, without *bruit*. In spite of stimulants, diuretics, and counter-irritation, the case seemed hopeless, when ten drops of tincture of digitalis were prescribed every four hours; and "from a state of agony she enjoyed comparative quiet in less than three days; the heart's action became daily stronger, as indicated by less tumultuous movement, and by slower pulse."

Two other and analogous cases are reported by Dr. Stirling in the same communication. A somewhat similar case, but complicated with valvular disease, is recorded by Dr. Murray (Medical Times and Gazette, March, 1865.)

Case 3.—J. K., aged 56, was admitted into the General Hospital, Birmingham, under Dr. Russell, March 24th, 1865. There was no history of rheumatism, but of a severe fall and striking the chest against a wagon forty years previously; also of winter-cough and dyspnœa for twenty years. He was strongly built, but his muscles were now flabby; the face was pale, and the venous circulation embarrassed. The legs were anasarcous; the heart's impulse was very feeble; the sounds were scarcely to be heard; there was no *bruit:* the pulse was so fluttering as to be uncountable; respiration 22, regular, but at times much hurried; he had much cough; there was dulness over the base of the lungs, and over a larger than normal cardiac area.

March 26th. He was ordered to take three times a day five minims of tincture of digitalis with ether and ammonia.

March 28th. The pulse was rather stronger, but still too fluttering to be counted; the sounds of the heart could not be distinguished from each other; the urine was scanty, loaded with lithates. He was ordered to increase the tincture of digitalis to nine minims, to have a colocynth aperient, two glasses of gin, and to have his legs punctured.

March 30th. The legs were discharging; the bowels were free; the urine was scanty; dyspnœa was urgent at times. He was ordered an extra glass of gin, and one-eighth of a grain of morphia every four or six hours. (The administration of morphia in heart-disease is made a special point in Dr. Russell's practice; in the present instance it is considered to have assisted the action of digitalis). This was continued; and on the following day (April 1st) he was greatly improved; breathing easier; pulse 100, regular; he passed last night 238 ounces of urine in twelve hours; the morphia did not cause sleep.

April 4th. He continued better; pulse 90, regular; his breathing was quieter, though he could not lie down; the anasarca was much less; he passed 96 ounces of urine in the last twelve hours.

April 6th. The impulse of the heart was diffused, abrupt, heaving; the dulness was almost obliterated; the sounds were exceedingly feeble, especially the second. He was ordered twelve minims of tincture of digitalis with ten minims of tincture of sesquichloride of iron three times a day.

April 11th. Breathing was easy; he could lie down; the œdema was nearly gone; the change for the better was most striking. He passed 84 ounces of urine in twelve hours.

Let me add briefly these "opinions." Dr. Gull (Medical Times and Gazette, July 29th, 1865) observes: "I look upon it as a fact, which clinical experience has clearly and definitely settled in my own mind, that digitalis is capable of diminishing the frequency of the heart's beat, and of increasing the power of the heart's impulse; and is especially useful in cases of disease of the left side, in which the action of the organ is very rapid and feeble."

Dr. Wilks (same reference) remarks of a case of "dilated enfeebled heart," that "this was just one of those cases in which digitalis might be expected to do good;" and relates an example of it.

Dr. Fuller says: "During many years I have observed that the cases of heart-disease most benefited by digitalis have been those in which the heart has been weak and dilated, and pulse feeble and irregular."

Granted, then, that digitalis is indicated in the conditions alluded to, let us examine whether any complications likely to be present will contraindicate it.

(*a.*) Will a state of fatty degeneration do so? If far advanced, it certainly will; for its subject will be liable to sudden death, which the action of digitalis may hasten. Some illustrative cases and opinions are recorded in the Medical Times and Gazette, July 1865. This is one of the most difficult points to consider with regard to the administration of the drug; for doubtless many weak hearts are weak because they are fatty; and, if this condition is to prohibit digitalis, how can it be said to be useful in weak heart? Moreover, it is difficult to ascertain how far the degeneration has advanced, though we may be sure of its presence. (See Dr. Stokes; and Kennedy on Fatty Heart. Edinburgh Medical Journal, 1859, part i.) But this suggested caution and difficulty are not greater or more unusual than with some other powerful drugs, and do not invalidate the conclusion derived from the above series of cases; only they call for this rule in a dubious case: commence with a small dose (five minims), better combined with an ether; watch carefully; increase gradually; and stop occasionally.

(*b.*) Will mitral regurgitation contraindicate digitalis? No, it will not; and this is generally—though by no means universally—acknowledged. An interesting case, illustrative of the value of the remedy in this form of disease, has been kindly forwarded to me by Dr. Keyworth.

Case 4.—"J. C., aged 62, in 1866, passed fragments of lithic acid calculi. In June 1867, his urine became scanty, and contained blood, and his legs became œdematous. He began to have much dyspnœa, and palpitation, and was found to have a systolic *bruit*, more distinct at the apex of the heart. In the following December, the ascites and anasarca were so great that he could not walk; and his breathing was so distressed that he could not lie down. He had continued cough with scanty expectoration, which often contained blood. In the interval he had taken at various times, and with slight benefit, tincture of perchloride of iron, squills and ether, acetate of potass, broom, and digitalis in small doses, elaterium and gamboge, quinine and acids. On 19th December he had been taking acetate of potass with spirit of sulphuric ether and tincture of opium, which mixture relieved his breathing a very little. Then I began to give him, in addition, digitalis upon the plan suggested by Dr. Mackey (in a paper which I read about that time); viz., half-drachm doses night and morning, in a litte water. His girth was then forty-six inches and a half. By January 15th, 1868, he had diminished to thirty-five inches. His urine had become gradually clearer, and less albuminous, often nearly free from blood. He continued the medicine up to the end of March, by which time the ascites was removed, and he could walk about the house and eat and sleep well. He can now (May) walk three or four miles, and, though he has occasionally œdema of the ankles, he is practically convalescent."

The effect of the remedy on the pulse was to increase its strength, to diminish its frequency, and to make it less intermittent

(*c.*) Will mitral obstruction contraindicate digitalis? No; it will not.

Case 5.—M. M., aged 40, had history of heart-disease for 17 years. She had had rheumatic fever twice, and bronchitis at intervals. In October 1865, the heart's action was irregular, tumultuous, and painful; the sounds were not clear; over the aortic valves there was marked roughness with the first sound, scarcely a *bruit;* when the heart was quieter a presystolic *bruit* could be distinguished, of which one could say, that it was, *perhaps*, more distinct at the apex; the radial pulse 60-64, visible, weak. She had giddiness; had never had epistaxis; the liver was congested; the urine was scanty; the extremities œdematous. I prescribed one grain of powdered digitalis, with two of mercury and squill, to be taken night and morning, and a saline diuretic three times a day. After the third pill, there was slight soreness of the gums, and copious diuresis began. Within a week she felt better than she had done for many years, and was able to walk without much difficulty of breathing. She then took one pill daily, and then on alternate days, and the improvement continued for many weeks. Later on she relapsed, to be again relieved by the same remedy; but, in the summer of 1866, she was found dead in bed (she had not been under treatment for many weeks); and Mr. Denny, who examined the body, informed me that the prominent morbid condition was an extreme ossification of the mitral valves.

(*d.*) Will aortic regurgitation contraindicate digitalis? I so far believe that it will, that I have never thought it prudent to treat that disease with the drug; and I am satisfied that the majority of the profession think similarly,—impressed, no doubt, by the strong language of Sir D. Corrigan (Edinburgh Medical and Surgical Journal, vol. 37, 1832):—"In every case of this disease in which digitalis has been administered, it has invariably aggravated the patient's sufferings." I have examined a large number of hospital reports of cases of aortic regurgitation, without being able to add definite facts to our knowledge upon this subject; but I was anxious to do so, because I am sensible of some contradiction to facts previously recorded indicative of a tonic action of digitalis. If the drug be regarded, as no doubt Sir D. Corrigan regarded it, as a sedative and depressant (he does not mention the dose given), one would fairly expect that it should injure a patient with compensatory hypertrophy in the disease under consideration; but, if the drug be regarded as a tonic to the heart, then surely it ought to relieve. A heart with aortic regurgitation is improved by strengthening measures of all kinds; either then digitalis (in small doses) ought to improve its condition, or it is no tonic.

I would answer, either that the decision against the remedy in this disease is formed from the action of too large doses, and that the question deserves reconsideration; or that the remedy acts as a tonic under certain circumstances, but not precisely under these—which would be a fact not unusual in the action of tonic remedies; or, again, that, granting a state of compensatory hypertrophy or dilatation of heart, in cases of aortic regurgitation, the very slowing of the heart's action may explain injurious effects, though the slowing be not necessarily from impaired power.

(*e.*) However this may be, I am sure that this remedy may be most useful in aortic *obstructive* disease; and such, I believe, are the cases which I often find alluded to in reports, published and otherwise, as "aortic disease benefited by digitalis." There has not been sufficient accuracy in distinguishing between even the two marked varieties of aortic disease—the regurgitant and the obstructive: in the former, I am content at present to believe digitalis hurtful; in the latter, I have a good deal of clinical evidence to prove its use. Space, however, allows me to insert only one illustrative case, for which I have to thank Dr. Russell.

Case 6.—A. W., aged 20, had acute rheumatism two years ago. After some months of failing health, dyspnœa, and dropsy, she was admitted into the General Hospital, Birmingham, on Oct. 14th, 1864. She was anæmic and emaciated; could not lie down because of sense of suffocation. Pulse 100; respiration 24. There was some anasarca. The was no albumen in the urine. For the first week she took little but wine. October 23rd. There was strong impulse of the heart over the whole left side of the chest, and distinct pulsation of the carotids. Pulse 108, exceedingly small. There was loud, shrill bellows-sound preceding the heart's impulse, at the apex (mitral). After improvement under remedies there was also a systolic *bruit* over the aortic valves, propagated up to aorta; and this, I consider, we may fairly take as evidence of aortic obstruction. The pulmonary sounds were clear.

October 25th. Pulse 108; respiration 32. She could not lie down. She was ordered four minims of tincture of digitalis, with ether, every four hours.

October 29th. Pulse 116; respiration 30. She appeared much relieved, and passed twenty-four ounces of urine in twenty hours. The tincture of digitalis was increased to nine minims.

November 1st. She was able to lie down lower, and was better. The urine was not increased. She was ordered to take fifteen minims of tincture of digitalis three times a day.

November 3rd. Pulse 100; respiration 22. The urine in forty-eight hours was forty ounces. She felt much better, and could lie down.

November 8th. The action of the heart was much quieter. Pulse 100, still very feeble; urine forty-eight ounces in forty-eight hours.

November 12th. She could walk about. She was ordered to take citrate of iron, and omit the digitalis.

December 6th. She left, much improved.

(*f.*) Will hypertrophy of the heart contraindicate digitalis? That will depend upon its cause, which will either be one of cardiac conditions already referred to, and which will, of course, guide the decision, or obstruction to the pulmonary circulation, or uræmia, which diseases do *not* by any means contraindicate this remedy. I have not met, nor do I expect to meet, with a case of uncomplicated hypertrophy; but such a condition affecting the left ventricle is reported (Medical Times and Gazette, March 1865), in which "digitalis was fairly and carefully tried, and aggravated the symptoms." Dilatation. also, is a secondary disease, and its treatment must be guided by its cause. In itself, it is likely rather to lead one to expect benefit from digitalis than to contraindicate it.

(*g.*) Is the drug likely to benefit functional disorder, palpitation, &c.? Not at all, as far as I know or can learn.

I proceed to inquire what preparation and dose will be suitable for a given case in which we may have decided that the drug is desirable. I find digitaline still rather distrusted in English practice, and teaching and custom in favour of the use of the tincture when any special effect on the heart is desired, and of the infusion when a diuretic action is wanted. The objection to the two former preparations is their uncertainty of strength or of operation, to the latter its tendency to nauseate. For general use, I have myself found the tincture the most reliable; but, if one is to depend upon it, great care must be taken in selection and keeping of the leaves. It is remarkable how independent sometimes are the cardiac and diuretic actions of the drug (Conf. Christison, Edinburgh Medical Journal, vol. xx, 1855; and Munk, Guy's Hospital Reports, 1844). As to the dose, it will be better, in any case when the heart's action is very feeble, to commence with five or ten minims of the tincture every four or six hours. I have seen it in such cases rapidly increased to fifteen, twenty, and thirty minims, and with benefit; but, as a general rule, such a dose as thirty minims is often enough, repeated twice in the twenty-four hours. An equivalent dose (practically) I consider to be one tablespoonful of fresh infusion, or one grain of the powder; but a patient taking such a dose should be kept recumbent, at least for half an hour before and for two hours after. I should hesitate before prescribing a larger dose than fifteen minims of the tincture to any patient following his occupation. There is no doubt about the fact that a dose of a half a drachm of the tincture repeated several times at short intervals, especially in the upright position, *may* produce dangerous interference with the circulation, whether it be from over-stimulus (Jones) or from a partial paresis—a tonic action. But, given as I have described, I have found no untoward results of "cumulative action" (Conf. Dr. Fleming, Edinburgh Medical Journal, December 1862). I can well believe that the drug is given less frequently and more carefully than it was thirty years ago. We must by no means ignore its external application. It is rather common in France. I find it praised by Christison (Edinburgh Medical Journal, 1850); and more recently, we have valuable testimony in favour of poultices of the fresh leaves (Med. Times and Gazette, January 25, 1868, Dr. Brown). The application of a strong decoction (two ounces of the leaves to a quart of water boiled to a pint) with lint and oil-silk has been of use; but I have found more satisfaction from a compound liniment of equal parts of tincture of digitalis, tincture of squills, and soap liniment.

Case 7.—H. N., aged 10, had slight general anasarca after mild scarlatina. The urine was of specific gravity 1,010, pale; one-eighth of the volume was albumen, blood-corpuscles, and fibrinous casts. He was ordered fifteen grains of compound jalap powder; and three grains of potassio-tartrate of iron with five grains of bitartrate of potash three times a day. Three days afterwards he seemed better, but sudden and general increase in the dropsy took place; the breathing became hurried, the lips discoloured; the child became drowsy, and vomited; he passed very little urine for thirty-six hours. Then I saw him again, and applied immediately linseed poultices to the loins, the liniment over the kidneys, and gave him two drops of the tincture of digitalis in combination with one grain of iodide of potassium and three grains of bitartrate of potash every four hours. Within an hour he passed urine, and within twelve hours two pints; and from this time forward he progressed uninterruptedly.

Case 8.—W. H., aged 2, had mild scarlatina. At the end of twelve days, general dropsy began, and in forty-eight hours was already so great as to threaten life. There was constant cough, and dulness at the base of both lungs. He has passed very little urine lately. I began the liniment, a mixture similar to the last, with tincture of squills and a jalap powder--all the remedies at once—about 8 p.m. Within an hour the child passed urine freely; and before morning he had excreted a pint and a half, and was relieved. He eventually recovered.

In connexion with the preceding and subsequent observations, it is desirable to notice an interesting theory that has been advanced to explain the action of digitalis; viz., that it acts primarily on the sympathetic (vaso-motor) system of nerves; that it stimulates the said system, and so causes increase in the contractile power of the capillary vessels. The theory has been well put lately by Legroux (*Du digitale*, Paris, 1867), and supported by reasoning somewhat as follows.

1. M. Galan has *proved* (Thesis, 1862) that digitalis, administered to frogs, will cause contraction of the capillaries of the web.

2. M. Legroux has *seen* the subcutaneous injection of digitaline (one *centigramme*) cause long continued contraction of the central artery of a rabbit's ear.

3. In certain conditions wherein the sympathetic is paralysed (partially), digitalis will act as known stimuli to it will. I will consider this point more in detail.

What are the effects of paralysis of a sympathetic branch? If it be complete, as after division of the nerve, there will be dilatation of the capillaries of the part supplied by it, increase of heat, congestion, perhaps effusion, &c. If it be partial—that is, if the nerve be doing duty in a feeble manner, as in patients suffering from fever, from debility after hemorrhage, or from chronic illness—there will occur similar accidents, though in a less degree; the normal balance of circulation will be interfered with; the heat of the body will be increased; the secretions will be altered; there will be partial congestion, as in the extremities; the vessels will be relaxed; arterial tension will be diminished; and the heart's action will be feeble, rapid, and irregular.

Now these effects may be controlled, and even obviated for a time, by a stimulus applied to the same system. Galvanising the distal end of the divided nerve will re-establish normal circulation; and a powerful emotion *may* re-establish apparent health for an hour or two in a feeble invalid. Now, taking the condition of the capillaries to indicate the state of the sympathetic —their relaxation to indicate a partially paralysed, and their contraction a tonic state of it—it is to be proved that digitalis has power to induce the latter.

In the first place, says M. Legroux, it will, when given to persons in feeble heath, *increase* arterial tension, as proved by sphygmographic trace (*op. cit.* p. 46): therefore it must increase the contractile power of the capillaries, the principal indicators and rulers of the said tension.

In the second place, it will lower the temperature of the person taking it, sometimes even *before* the heart action be slowed (Wunderlich and others, quoted at p. 70): therefore its primary effect is not on the heart, but on the capillaries; and it is to contract them.

In the third place, it will diminish the frequency of the heart-beats, and yet it will, in equal proportion, increase arterial tension (Marey); we conclude, then, that the heart is not weakened, but is slowed secondarily to the contraction of the capillaries. This slowing does not occur till twelve, twenty-four, thirty-six hours after administration of a moderate dose; moreover, it is often preceded by a quickening. This latter fact is to be explained as a consequence of increased effort required to overcome the resistance of the narrowed capillaries to which the heart was not accustomed (*sic*).

In the fourth place, it will relieve local congestion; and of this clinical experience will give us proofs. It has been of service in pneumonia (Lissauer, Thesis, Berlin, 1856); in uterine and pulmonary hemorrhage; and markedly in hemorrhoids. This last disorder is a good instance in point, because cure may be produced without notable effect on the heart; and, as this is not generally known, I will insert here a few cases kindly forwarded to me by Mr. Duncalfe, who drew attention to this subject in 1859.

Case 9.—April 1859. T. W., aged 45, had drank freely, but not lately. He had had piles occasionally for many years, more persistently for the last two. With each motion now he passed a little blood and much mucus. On examination, no external pile was found. The sphincter, when pressed upon firmly, gave the sensation of a hard swelling underneath. On straining, there was protruded a dark bluish pile, which was painful to the touch. The sphincter was firmly contracted, and admitted the finger with some difficulty and with much pain. Two or three painful protrusions were felt within the rectum; and much heavy throbbing pain was felt after withdrawing the finger. He was ordered tincture of digitalis, in ten-drop doses, every three hours during the day. After two days' trial, he said "he had not had so much ease for months." The sphincter was less irritable. There was some mucus, but no blood. He was ordered to take one teaspoonful of castor-oil in milk every morning, and to continue the digitalis. Five days after the first administration, "passes no blood, no mucus, and is free from pain." Since the report, he has been under treatment on three separate occasions for piles—the result, no doubt, of irregular living. Relief and cure have, on each occasion, followed the use of digitalis.

Case 10.—June 1859. N. S., aged 40, stout, plethoric, had had piles for several months. He had taken different remedies, without more than temporary relief. He passed very large quantities of blood after each evacuation, and suffered much from tenesmus and pain up the sacrum. Externally, three piles, one of the size of a horsebean, and two about as large as peas, were observed. The sphincter was firmly contracted. The piles were returned within the rectum, but gave rise to much pain and desire to defæcate. Fifteen-drop doses of tincture of digitalis were ordered to be taken every three hours. On the second day after taking the medicine, he had no more bleeding, no pain: said he was well. He continued the medicine in smaller doses for two or three days, and at the end of a fortnight, had had no return. Three months afterwards, he had signs of relapse after hard lifting. He immediately applied for his medicine, which was given to him; and he was not troubled afterwards.

Case 11.—1867. E. C., aged 48, a strong man, accustomed to walk much, had had piles for years. He had them tied once. The sphincter was loose, easily yielding to the protrusion of large congested piles. He lost blood with each motion. He could scarcely take exercise, owing to the faintness produced by dragging pains. His health had been failing lately. The skin was loose and perspiring; the complexion haggard; tongue pale and tremulous. He was ordered fifteen minims of tincture of perchloride of iron, with ten minims of tincture of digitalis, every four hours. When the medicine had been continued for a week, he was better, and could walk longer without the piles coming down. After continuing the medicine for three weeks, he could walk without inconvenience for five or six miles.

His health, however, was much below his standard. He went to the seaside, and returned home well. He had had no inconvenience from piles since he left home.

Case 12.—1863. A. F., mother of seven children, had been subject to piles during gestation and after delivery of her last three children. Previous treatment never relieved her. One week after her last delivery, she was found to have a large protrusion of piles and mucous membrane external to the sphincter, tender, and producing much uneasiness. Digitalis was given in fifteen-drop doses, combined with five grains of extract of henbane. The bowels were relieved by enemata. In two days, the piles could be returned within the sphincter, and protruded only after defæcation. The treatment was continued for a week, and then the tumours were less vascular and smaller, scarcely tender, and could be readily returned without pain. There was however, much redundant mucous membrane; and the piles were touched with the strong nitric acid, with the usual precautions. In three weeks' time she was well. She has since borne another child, and the piles were not so bad as to require treatment. I ought to add to these cases, that I have myself found some good effect from its use in hemorrhoid, but not much in cases with marked constitutional disorder, hepatic or otherwise.—*British Medical Journal, May* 30 *and July* 11, 1868, *pp.* 529, 27.

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